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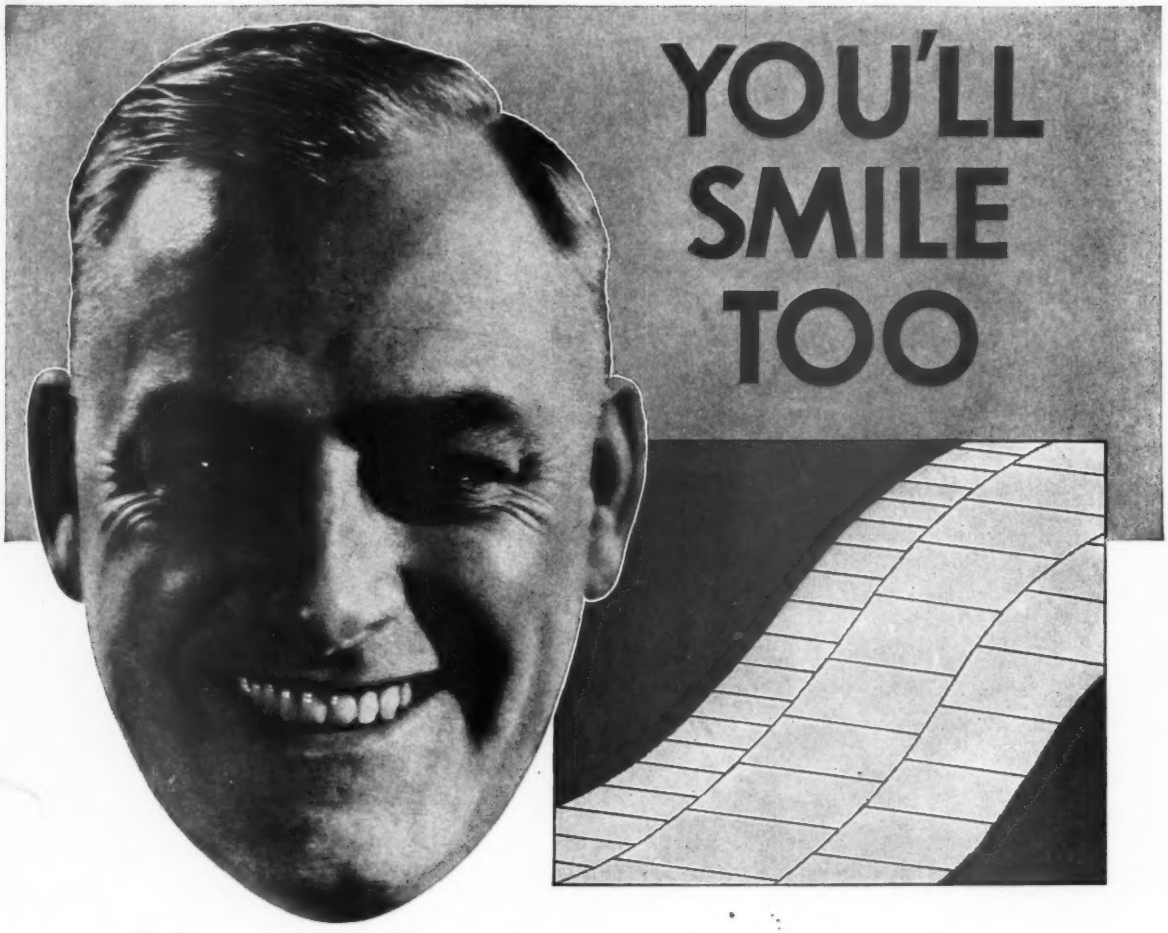
Pacific PULP & PAPER Industry

14

IN HIGH GEAR . . . The groundwood and sulphite pulp and paper mill of the HAWLEY PULP & PAPER CO. on the Willamette River at Oregon City, is running at a fast clip these days.



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As It Leaves the Machine

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Black-Clawson
TRIPLEX CUTTERS

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v.14, no.1-12
Jan.-Dec. 1940

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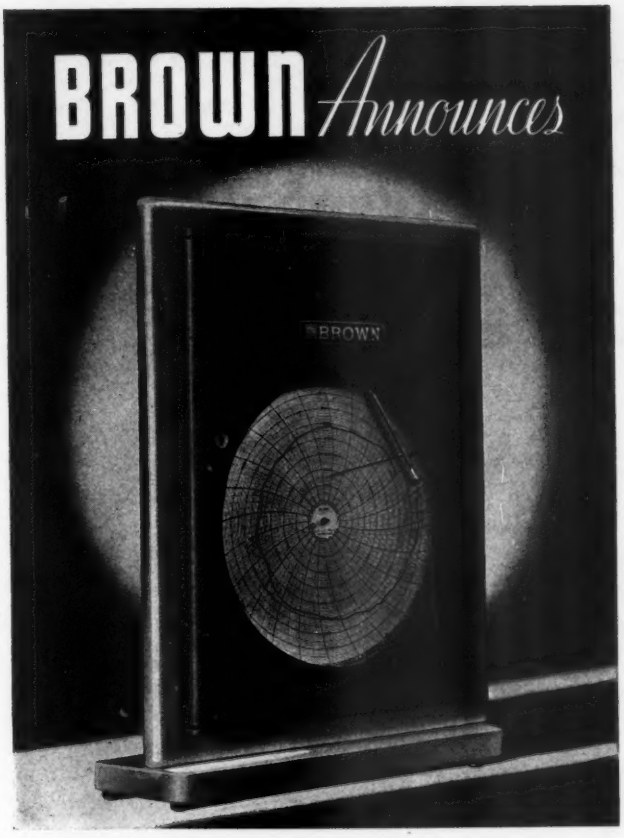
BROWN *Announces* *a New Thermometer*



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BROWN THERMOMETERS AND PRESSURE GAUGES

Accurate Measurement with Simplicity

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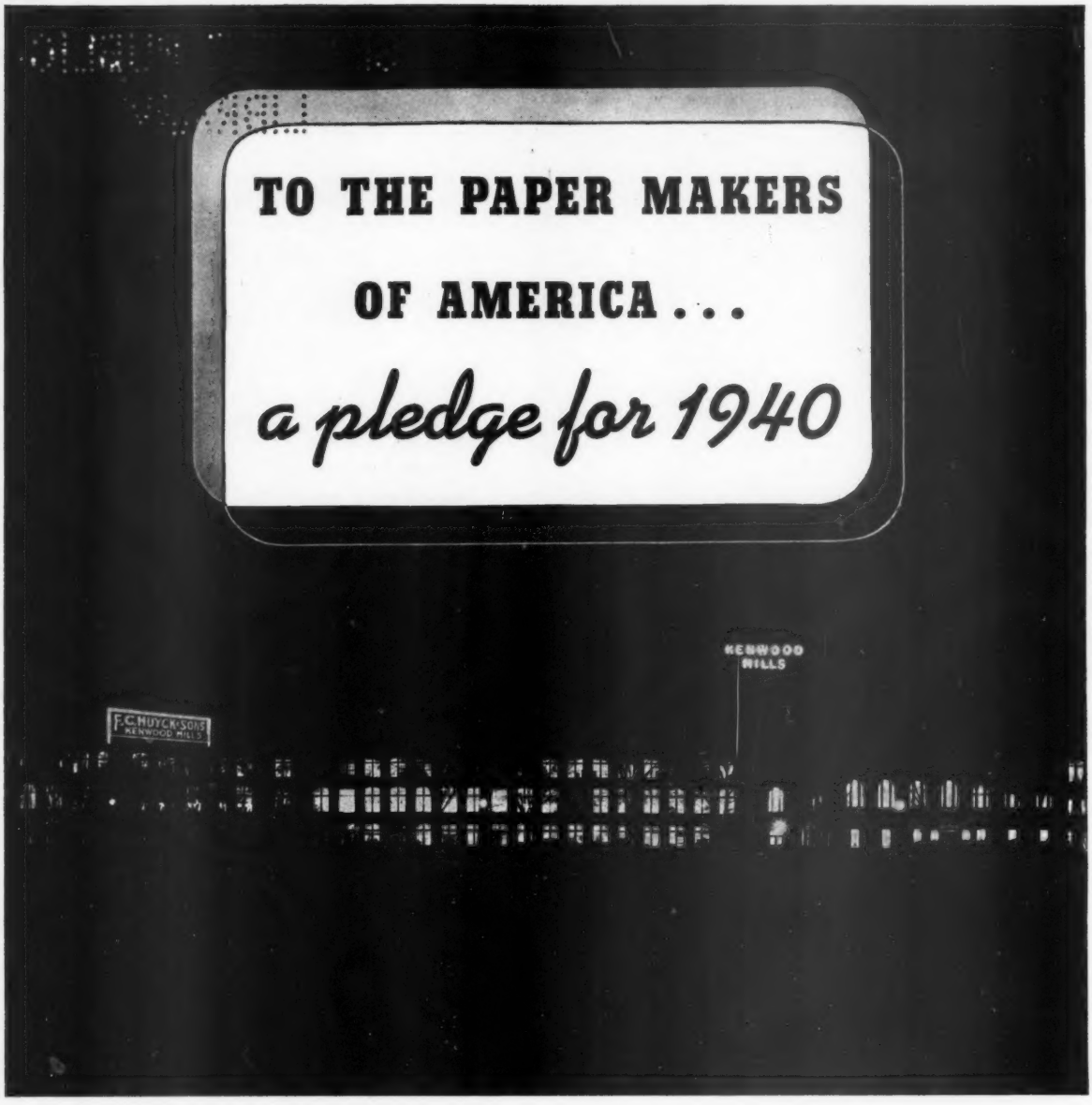

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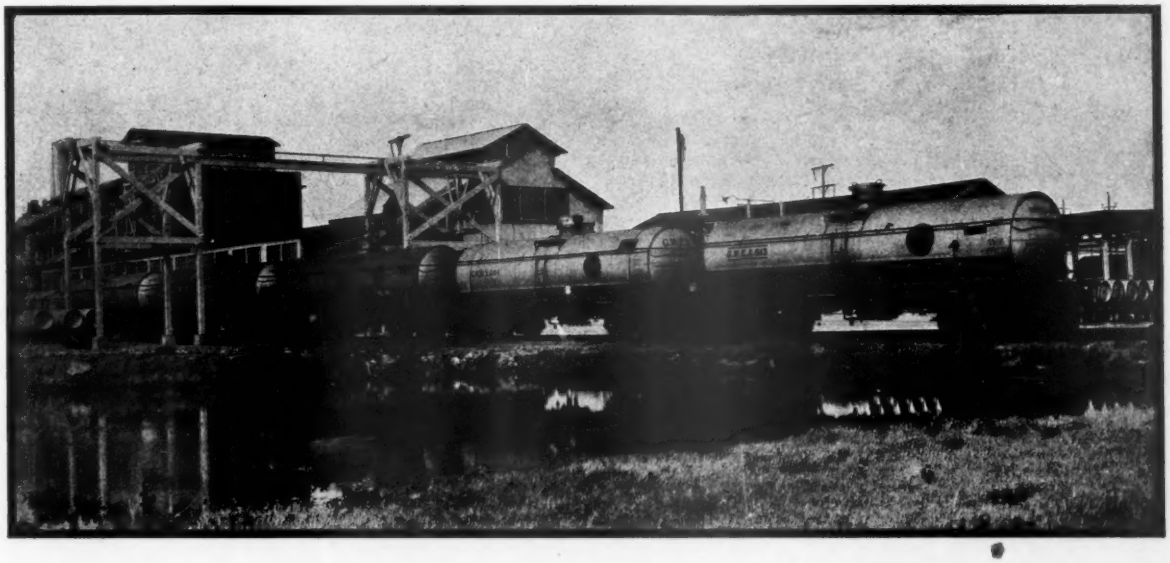

This "squadron" of tank cars is lined up at the Great Western Plant waiting to load Liquid Chlorine and Sulphur Dioxide for our customers.

Sometimes our own buyers are surprised at the great volume of heavy chemicals consumed by industry on the Pacific Coast. But the figures reach impressive totals. It is not unusual for as many as seven or eight tank cars to leave the Great Western Plant in a single day, carrying shipments of Liquid Chlorine, Caustic Soda, Ferric Chloride, Sulphur Dioxide or Ammonia.

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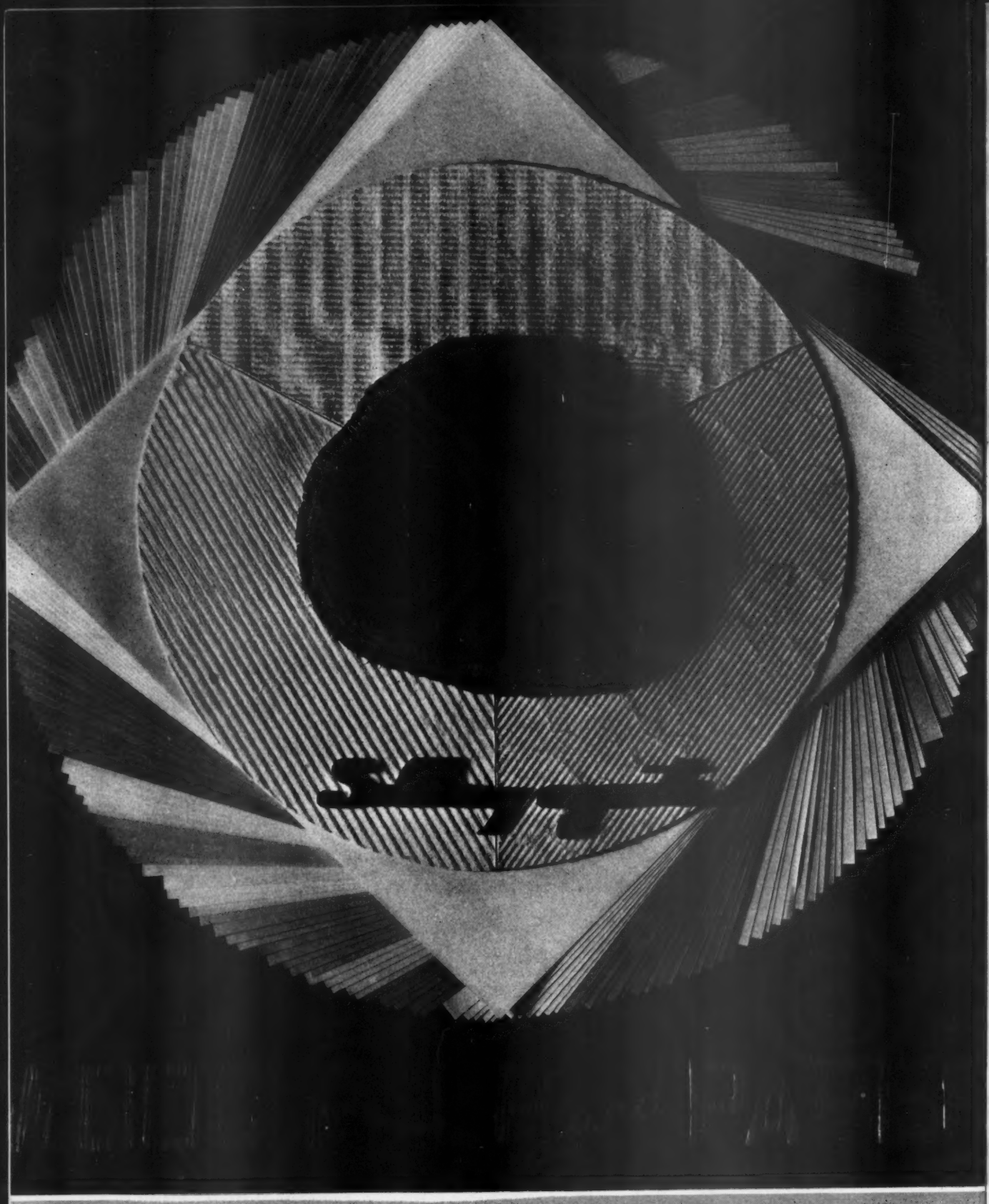

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Pulp Imports Rise Again in November

Tonnage increased 25.8% over October, 69.5% above September—Imports from Sweden up 68.2% over October—November imports largest since October, 1937—Eleven month's imports up 20% in 1939 over 1938—The general pulp and paper situation here and abroad.

DESPITE the hazards and delays incident to the shipping from Scandinavian countries the total movement of wood pulp from that part of the world to the United States increased again in November for the third month in succession.

The explanation seems to lie in greatly increased orders of Scandinavian pulp by converting mills in this country—orders so much larger than normal during the months preceding the war that a sufficient quantity filtered through the war zone and reached our Atlantic ports to register increases. Wood pulp arrivals during September and October were estimated to be between 75 and 85 per cent of expected deliveries in accordance with contracts. It has been estimated by reliable authorities that in November only 60 per cent of the pulp contracted for delivery to United States mills actually arrived during the month. Yet November showed the largest imports since October 1937 and a 25.8 per cent increase over October.

The desire to deliver Scandinavian pulp to United States ports is shared equally by the buyers and the sellers. The converting mills are willing to build up inventories fearing higher prices and a tight supply situation, while the sellers in Scandinavia are anxious to make deliveries before ice closed a number of Baltic ports and to obtain badly needed dollar exchange.

The non-delivery of all the Scandinavian pulp expected in these past three months is said to be due primarily to two factors, the scarcity of freighters willing to carry pulp from the Baltic ports to this country and to the delays caused by the German inspection of the cargoes. The two weeks or more taken by Germany to examine the cargoes of ships destined for the United States causes bunching of arrivals and in turn produces somewhat misleading import figures. This latter is the reason why the pulp industry does not as yet believe the import figures a true guide to the foreign pulp situation.

If it were not for the shortage of ships and the German inspection, the imports of wood pulp into the United States in September, October and November would have been much greater.

Sweden Under Pressure to Sell

● Sweden, faced with further large emergency expenditures for national defense, already had an adverse trade balance in the first eleven months of 1939 more than double that of the same period in 1938. The United States Department of Commerce reports that Sweden's excess of imports over exports in the first eleven months of 1939 was $121,680,000 (based upon the Swedish crown's exchange value of 24 cents) as compared with $49,440,000 in the first eleven months of 1938.

"This noticeable worsening of the foreign trade position," says the Department of Commerce, "is accounted for by an increase of about $30,240,000 in imports of government reserve materials; record consumption throughout the year, owing to prosperity conditions; an increase through October of 35 per cent in the import price index with a corresponding export price increase of only 10 per cent; and heavy purchases for bolstering inventories of both raw materials and manufactured goods since midyear. Of the heavier import excess, 38 per cent occurred during September. The October-November indications are that the import excess for the entire year 1939 will be considerably increased over the present figure for eleven months."

It is to be expected, then, that Sweden will do everything possible to maintain exports of wood pulp to the United States, her major neutral market, and to raise pulp prices as rapidly as the market will permit in order to increase her dollar credits and to hold the adverse import balance as low as emergency conditions will allow.

COMPARISON OF WOOD PULP IMPORTS

October and November, 1939

Type of Pulp	Finland		Norway		Sweden		Canada		Totals All Countries	
	Oct.	Nov.	Oct.	Nov.	Oct.	Nov.	Oct.	Nov.	Oct.	Nov.
Mechanical Unbleached	753	2,470	-----	-----	5,840	3,984	14,934	15,653	21,527	22,163
Unbleached sulphite	13,293	8,842	2,565	3,177	38,232	59,547	18,060	14,085	79,397	90,304
Bleached sulphite	4,771	3,353	12,150	9,272	7,780	9,258	30,864	30,697	56,398	53,492
Unbleached sulphate	8,795	12,379	393	3,507	31,694	68,181	5,800	5,700	47,539	92,659
Bleached sulphate	669	146	-----	-----	5,015	7,990	4,484	4,150	10,168	12,286
Soda	-----	-----	-----	-----	-----	-----	1,113	1,145	1,113	1,145
Totals	28,281	27,190	15,108	15,956	88,561	148,960	75,255	71,430	216,142	272,049
Per cent of change from previous month	—15.9%	—3.85%	+259.9%	+5.61%	+52%	+68.2%	+10.1%	—5%	+34.7%	+25.8%

November Pulp Imports 52% Larger Than in 1938

● Wood pulp totaling 272,049 short tons and valued at $9,812,469 was imported into the United States in November 1939 against October imports of 216,142 short tons and September imports of 160,417 short tons. The November imports were 25.8 per cent greater than those in October and October imports were 34.7 per cent higher than September's. September imports were up 6.5 per cent over August.

The November wood pulp imports were 52 per cent larger than in November 1938 when the total was 172,731 short tons. The increase was 89,805 tons.

A comparison of the November pulp imports by countries shows that; Finland supplied 27,190 tons in November 1939 against 29,007 tons in November 1938, a decrease of 6 per cent; Norway supplied 15,956 tons against 8,249 tons, an increase of 93 per cent; Sweden supplied 148,960 tons against 93,507 tons, an increase of 59 per cent; Canada supplied 70,430 tons against 41,968 tons, an increase of 67 per cent.

November and October imports by grades and countries are shown in the accompanying table.

Eleven Month's Imports

● The imports of wood pulp into the United States for the first eleven months of 1939 amounted to 1,717,453 short tons of all grades as compared with 1,425,079 short tons in the same period of 1938. This was an increase of 292,374 short tons or 20 per cent in 1939 over 1938.

By countries, the imports in the first eleven months of 1939 increased 25 per cent from Finland, 37 per cent from Norway, 8 per cent from Sweden and 35 per cent from Canada. Details of the imports by grades and countries will be found in the accompanying table.

The Shipping Situation

● Shipping conditions from the Scandinavian ports to United States Atlantic ports are no better than a month ago and many believe they are worse due to increasing scarcity of ships.

The affidavit system inaugurated by New York importers of foreign pulp early in December has not been officially recognized by the German government as being acceptable in lieu of a minute search of the pulp carrying ships. At least there has been no public statement that Germany has accepted the affidavit idea. In the statement issued when the plan was announced, the hope was expressed that the affidavits signed by American consignees will be accepted by the German government as evidence that the pulp is for use in this country and not to be re-exported to countries hostile to Germany.

Germany's decision to examine these pulp shipments is said, on good authority, to have been caused by the re-export of Scandinavian pulp from United States Atlantic ports to England shortly after the war began. The inspection is said to have been instituted to prevent this from becoming a regular practice. At the time the affidavit plan was developed Germany was holding approximately fifteen ships carrying pulp for United States ports and the consignees were required to furnish affidavits guaranteeing the pulp would not be re-exported. Preparing the affidavits in advance would, it was hoped, speed up the shipments.

Shipping troubles are not confined to the war zone. Pulp and paper manufacturers on the Pacific Coast are finding it difficult to obtain needed cargo space for both inter-coastal and foreign shipments.

The withdrawal of American ships from lanes close to the war areas; the sale of ships to foreign governments; the shifting of boats from inter-coastal service to runs that now appear more profitable; the commandeering of all British ships by the Admiralty, and the curtailment of Japanese line service between United States Pacific Coast ports and ports bordering the eastern and southern Pacific Ocean due to the cancellation of the American-Japanese commercial treaty on January 26th, are all important factors operating to hinder the movement of wood pulp and paper by water. Executives of Pacific Coast mills are working hard to obtain adequate inter-coastal and foreign service.

Canadian Exports

● There has been much supposition lately to the effect that Canada was replacing the Scandinavian countries as a source of wood pulp for the paper mills in England but the Canadian export figures for November 1939 do not support this thought.

According to export data released by the Dominion Bureau of Statistics at Ottawa, 4,640 tons of all grades of wood pulp, valued at $183,160 was shipped during November to the United Kingdom. This was an increase of but 934 tons over the October shipments of 3,706 tons.

As yet Canada has not replaced the Scandinavian countries as the chief supplier of wood pulp to England.

In November Canada exported 79,178 short tons of wood pulp worth $3,435,729 as compared with 75,483 short tons valued at $3,260,926 in October and 53,874 short tons worth $2,493,187 exported in November 1938.

The United States took 72,738 short tons valued at $3,150,261 against 69,773 short tons valued at $2,971,650 in the month preceding.

By grades the November exports included; 34,830 short tons of bleached sulphite worth $1,918,591, compared with 22,682 short tons valued at $1,336,931 in November 1938; 17,667 short tons of unbleached sulphite valued at $628,856 against 9,436 short tons valued at $337,640 in November 1938; 9,901 short tons of sulphate pulp valued at $469,071, against 9,331 short tons worth $511,893; and, 14,344 short tons of mechanical pulp

IMPORTS OF WOOD PULP INTO THE UNITED STATES

	November, 1939 Tons	November, 1938 Tons	1939 over 1938
Finland	27,190	29,007	— 6%
Norway	15,956	8,249	+93%
Sweden	148,960	93,507	+59%
Canada	70,430	41,968	+67%
Total	262,536	172,731	+52%

valued at $357,803 against 11,173 short tons valued at $262,623 in November a year ago.

In the first eleven months of 1939 Canada exported 605,550 short tons of all grades of wood pulp worth $27,068,403 compared with 504,322 short tons valued at $25,395,578 in the same 1938 period.

This represents an increase of 101,178 short tons or 20 per cent in 1939 exports over 1938.

● With the Canadian dollar depreciated approximately 12 per cent manufacturers of wood pulp and newsprint in Canada are receiving the equivalent of an increase in prices.

The English Situation

● Although Sweden has discontinued the publication of export data on wood pulp and other commodities and the British no longer release their import data, it is evident that British paper and board mills are still obtaining wood pulp in considerable quantity from the Scandinavian countries.

The supply situation is tight due to rigid control of shipping, of imports and the British Paper Control's holding down of prices which the mills are permitted to pay for imported pulp. Another deterrent is the monetary dislocation occasioned by Sweden's tieing the kronor to the dollar last August after many years of close relationship to the pond sterling. When sterling declined from around $4.60 prior to the outbreak of the war to less than $4.00 the kronor did not follow but remained at 23.87 cents in relationship to the dollar. The kronor had already been depreciated as has been pointed out in this journal, but it held to this level.

The British buyers have to supply more pounds at, say $3.94 to buy Swedish pulp than they had to supply when the pound was worth $4.60.

That pulp is entering England from Scandinavia in fairly large quantities is evident from the following statement under Cellulose and Wood Pulp in the December 1st issue of The World's Paper Trade Review, published in London, "It is understood that supplies already contracted for will cover the requirements of the mills for some time to come, though occasional orders are still being placed."

Again, on December 15th, the journal said of the pulp situation in England, "Conditions in the wood pulp market are largely unchanged, although there has been a certain amount of prompt buying of strong sulphite, kraft and mechanical pulp.

"Very little business has been done on 1940 account, as sellers have to face uncertain factors which make it difficult to arrive at long-term arrangements.

"The market conditions of the future will be conditioned by the political development, more particularly as they affect the Northern countries; the possibilities of shipment; the costs of manufacture, and on none of these points is it possible to pronounce with certainty at the moment.

"That costs of production next year will be higher is certain, for manufacturers will have to pay more for their timber, coal and chemicals, three important items in the cost of manufacture."

Under the heading "Empire Raw Material" The World's Paper Trade Review comments editorially on the possibilities of developing the Canadian wood pulp industry as a permanent source of raw material for Great Britain's paper mills. As it is of interest to the pulp industry the editorial is reprinted below in full.

"Difficulties arising in connection with shipments from the Northern countries suggest that paper makers may have to look Westward to restore a shortage in their principal raw material, namely wood pulp. Canada of course, is rich in pulp wood and her output of pulp could doubtless make up any deficiency which might occur elsewhere. The Dominion already provides some of the requirements of British mills; but they could do so to a greater extent if necessary. Efforts have been made from time to time to bring about a closer association between the British mills and the pulp areas of Canada: but they have not progressed in the past as might have been expected.

"Usually some economic consideration has stepped in, either that Dominion suppliers turned to the United States when that market has been favorable; or British consumers have leaned to the Northern countries when it seemed in their interest to do so. As a consequence, a certain lack of confidence arose through want of a proper understanding. One who knows the Canadian position suggests that if Dominion producers of wood pulp knew that they could depend upon receiving a percentage of the British consumption, they would be willing to develop their connection with this market.

"The present seems a favorable opportunity for enlarging this connection. Freights are not so divergent as they were; and business with Canada would prevent currency going abroad or, at all events, would keep it within the Empire. In making arrangements for future supplies, it is necessary to look well ahead; and this question of obtaining wood pulp from Canada deserves immediate consideration."

COMPARISON OF WOOD PULP IMPORTS

11 Months 1938 and 1939

(Short Tons)

	Finland		Norway		Sweden		Canada		Total	
	1938	1939	1938	1939	1938	1939	1938	1939	1938	1939
Mechanical Wood Pulp	13,418	18,449	514	6	17,458	37,302	110,109	141,270	141,499	197,027
Sulphite—										
Unbleached	106,705	103,828	3,960	13,244	355,730	333,173	78,433	97,722	544,828	547,967
Bleached	46,089	62,838	46,353	59,087	36,390	58,948	149,366	226,845	278,198	407,718
Sulphate—										
Unbleached	61,027	97,964	10,979	12,885	255,925	294,977	42,705	54,407	370,636	460,233
Bleached	2,533	6,034	310	224	48,119	49,321	30,278	41,705	81,240	97,284
Soda	-----	-----	-----	-----	-----	-----	8,678	7,224	8,678	7,224
Totals	229,771	289,113	62,116	85,446	713,622	773,721	419,569	569,173	1,425,079	1,717,453
Per cent change in first 11 months of 1939 over same period in 1938		+25%		+37%		+8%		+35%		+20%

Pulp and Paper Supply, Demand and Prices

● Since imports of wood pulp from the Scandinavian countries have increased in each of the three months of war for which reports are available, the question is frequently asked, "Why are the American pulp mills so busy and practically sold out for 1940"?

A partial answer is that the American paper and board industry is running close to capacity. The American Paper & Pulp Association's production ratio report for 1939 shows an average of 84.9 per cent, the low point of 75.2 per cent being in July and the high point of 97.2 per cent in November. From 82.9 per cent of capacity in August the percentage ratio rose to 88.7 per cent in September, to 96.6 per cent in October, to 97.2 per cent in November, and dropped to 92.7 per cent in December, due largely to the Christmas shutdowns.

The year's average of 84.9 per cent of capacity was 12.6 per cent better than the 72.3 per cent average for 1938, and 4.3 per cent higher than the busy year of 1937.

Paperboard operating ratios ranged from a low of 60 per cent in January 1939 to a high of 84 per cent in October. December dropped to 73 per cent. For the year the ratio of operations to capacity on the inch-hours basis was 70.5 per cent, according to the data released weekly by the National Paperboard Association. This was 9.5 per cent higher than 1938 but 2.5 per cent less than 1937 ratios.

But the high rate of operations in the paper and paperboard industries do not entirely explain the more than capacity demand felt by American pulp mills since late August, for the paper and paperboard industries have been busy before while the pulp mills remained in the doldrums.

The answer arises out of the human instinct of self-preservation. The converting mills, paper and board mills who must buy all or part of their wood pulp, feared that war in Europe would shut off the Scandinavian supply and they would be forced to shut down. Hence the sudden rush to buy American pulp. As there is not enough American pulp offered on the market to supply the demand for all grades the buyers have contracted for all the American pulp they could get. For those who could not obtain enough from American sources, the next choice was Canada, which is considered a fairly safe source since no water transportation is involved. The remaining pulp business for 1940 was placed, out of necessity, with the Scandinavian producers with the hope that some of it would be delivered. Many American paper mills are today at the mercy of imports because they had not been buying any American pulp and could not obtain any due to the sound practice of the domestic pulp mills of taking care of their old customer's requirements before accepting new customers.

Imports have not been adversely affected so far and the question arises, "Why have not these increased pulp imports affected the operations of the American mills?" The pulp buyers dare not take the chance of curtailing their orders to American pulp mills because of a clause in the 1940 American contracts. Suppose a converting mill has contracted for 500 tons of pulp per month from an American producer, but has no need for more than 300 tons in February. In the past the order could be cut down and the pulp mill suffered, but this year the seller has the option at the end of each quarter of reducing the amount shipped the buyer to the minmum taken in any month of the preceding quarter. If the buyer, mentioned above took 500 tons in January and March but only 300 tons in February, the seller could limit shipments in the second quarter to 300 tons per month if he desired. Under the present uncertain conditions no pulp buyer to going to take the chance of curtailing American purchases but will vary his foreign buying. This is a reversal of the custom in the past and it is to be hoped that the system may become a permanent one in order to provide steady employment for the employees of domestic pulp mills.

Another reason for buyers preferring American pulp is price. American pulp is cheaper at the moment by about $11 per ton, a sizeable difference. A buyer of bleached sulphite today can purchase Scandinavian pulp at around $60 per short ton but additional freight and war risk insurance raises that cost to approximately $71 per ton delivered at Atlantic ports. American bleached sulphite is available at $60 per ton delivered at the same ports. The unbleached sulphite situation is the same, $50 for domestic and around $61 for Scandinavian.

The policy of American pulp mills is to avoid a panic market as occurred in 1937 when so many buyers thought a world pulp shortage was in the making. The domestic producers have the results of that spree clearly in mind and are determined to prevent, if it is within their power to prevent, a recurrence of the unhappy aftermath which followed in 1938.

Further, the buyers of pulp are in competition with the self-contained pulp and paper mills. The domestic pulp producers must keep their customers competitive or else lose business. As a result every effort will be made to keep the price of domestic pulp from getting out of bounds regardless of the increase in demand.

On the other hand the costs of producing pulp have risen, particularly the cost of wood. The $10 per ton increase in the price of domestic pulp which became effective January 2nd was largely to cover increased costs and to provide a small profit which was not to be found in the old price even with costs lower.

Another deterrent to rising pulp prices is the price situation in paper. While there have been increases in many grades of paper the increases have been slight and paper manufacturers are not in a position to pay higher prices for raw materials unless paper prices can be raised. Paper manufacturers endeavored to put themselves in a flexible position as regards raw materials prices for 1940 by making most contracts on a quarterly adjustment basis as is the custom of the domestic pulp industry. Even Pacific Coast newsprint is guaranteed in price for 90 days only.

Paper Inventories

● With the American paper industry running at better than 90 per cent of capacity during the last three months of 1939 there is much speculation as to whether or not inventories have been built up beyond sound limits. Apparently stocks of paper are not, at the beginning of 1940, at all excessive, at least as far as the West Coast is concerned. The Pacific Coast situation ought to be a criterion for the rest of the country for jobbers in this region ordinarily carry heavier stocks of higher grade papers than do those closer to the mills producing them. Only a slight increase of inventories above those during August are reported by Coast jobbers. One experienced jobber states that it is difficult to build up an inventory on a rising market even in the face of increased orders from the supplying mills. Despite stepped up orders the job-

ber's customers have kept his inventory from growing as large as he would like to have it under existing conditions.

The improvement in business generally during the last four months of 1939 developed big increases in the consumption of all grades of paper. Following the holidays the volume will decline some but whether it becomes serious or not remains to be seen. The Pacific Coast jobbers do not think the inventory situation should give the paper mills or the pulp mills anything to worry about at present.

A Hopeful Sign

● "An ounce of prevention is worth a pound of cure." The domestic pulp producers, together with a growing number of paper manufacturers, are keeping this adage before them during the current busy period and are planning to exercise all their collective influence to prevent a catastrophe in their industries upon the cessation of hostilities in Europe.

Realization that the end of the war will mean a raiding of American markets by impoverished European nations is not confined to the pulp and paper manufacturers. An increasing number of business men are becoming aware of the danger of our exposed position in foreign trade and are determined to prevent a deflationary movement in the United States caused by after the war inflation in Europe.

After the war it will be to the advantage of the Scandinavian pulp producers to again tie their currencies to the pound sterling, which means further depreciation for the pound today is worth $3.94 against $4.60 before war began. This is a further depreciation of 14.3 per cent. Sweden, for example, with its currency already depreciated, had an advantage in the American market before war was declared. An additional 14 per cent, which she would have if she returned to the pound and the pound remains at $3.94, would make it impossible for American producers to compete at all.

The bright spot is the recognition of this possibility. It is encouraging, too, to note that more and more paper manufacturers, both buyers of pulp and those producing their own pulp, are realizing that the price structure for paper could not hold with a drastic decline in pulp prices after the end of the war, and are anxious to help provide against this contingency.

During the current session of Congress a number of American industries will collectively endeavor to obtain amendments to the Anti-Dumping Act of 1921. The amendments to be offered will provide that the question of dumping be determined upon the American cost of production, not the foreign cost of production or foreign sales price, which bases have proved impracticable as yardsticks in view of the great difference between wages paid here and in foreign countries. Further, amendments will seek to make action by the Secretary of the Treasury mandatory rather than discretionary, as at present.

It will be recalled that Representative Martin Smith of Washington introduced a bill seeking to amend the anti-dumping act late in the last session. His bill will likely be brought up again and strong efforts put forth to pass it.

The effort to amend the Anti-Dumping Act of 1921 should not be confused with tariffs. Wood pulp comes in duty-free, as do a great many other products. The amendments are nothing more than logical efforts to keep American producers, who are paying high wages, competitive with European producers who are paying low wages. No tariffs are involved.

A high wage scale without work is useless, a meaningless gesture, and there can be no work for Americans if foreign pulp and other products are permitted to be sold at prices below American costs of production.

This legislation will be among the most important before Congress at the present session but unfortunately the public generally is not aware of its importance. An amended anti-dumping act would benefit all concerned, providing steady work for American pulp and paper mill employees, a profitable price for foreign as well as for domestic pulp producers, and a stable raw material market for American paper manufacturers, both for those who buy pulp and for those who make part or all of their own.

Union Complains Members Can't Find Mill Entrance

● Members of Local 199, Brotherhood of Pulp, Sulphite & Paper Mill Workers who work at the Tacoma Division of Rayonier Incorporated have recently petitioned the Tacoma city council to install street lights on Taylor way, near the entrance to the mill.

In their petition the local's members recite their difficulties in the finding the entrance to the plant at night due to the lack of illumination.

North American News Production Up 10.9% in 1939

● Production in Canada during December, 1939, amounted to 240,656 tons and shipments to 264,620 tons, according to the News Print Service Bureau. Production in the United States was 77,836 tons and shipments 78,283 tons, making a total United States and Canadian newsprint production of 318,492 tons and shipments of 342,903 tons. During December, 26,313 tons of newsprint were made in Newfoundland, so that the total North American production for the month amounted to 344,805 tons. Total production in December, 1938, was 312,363 tons.

The total North American output of newsprint paper in 1939 was 4,116,749 tons, of which 2,869,266 tons was made in Canada, 939,442 tons in the United States, and 308,041 tons in Newfoundland. The Canadian output was 9.3 per cent more than in 1938, that in the United States 14.6 per cent more, with a gain of 14.8 per cent in Newfoundland, making a total continental increase of 403,710 tons, or 10.9 per cent.

Stocks of newsprint paper at the end of December were 169,502 tons at Canadian mills and 12,952 tons at United States mills, making a combined total of 182,454 tons compared with 206,865 tons on November 30, 1939, and 180,021 tons on December 31, 1938.

Pacific Straw Says Formula Can't Be Found

● The Pacific Straw Paper and Board Company of Longview, Washington, stated in a suit filed December 28th against the estate of Charles F. Schaub and against Ruth M. Springer as executrix, that the secret formula Mr. Schaub allegedly had for the manufacture of paper board has not been discovered and probably never existed.

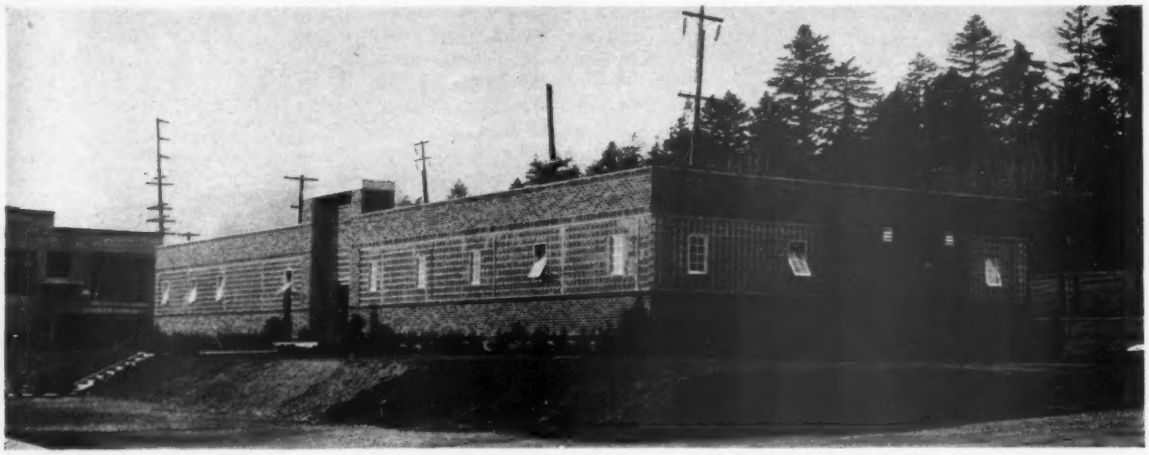
According to press reports the company alleges that Schaub was furnished with large blocks of shares with the understanding he had a secret formula which would be used in the local plant. The formula says the Longview Daily News, was supposedly so secret it was never shown to other officers of the company and was believed to have been kept locked up in a special safe compartment, it was alleged.

After Mr. Schaub's death last year, officers of the company sought to locate the formula but were unable to do so, the complaint declares. The company asks that the shares of stock held by Mr. Schaub be cancelled and also seeks $44,404.52 in company funds which Schaub allegedly spent for his personal use, in addition to $3,000 which he allegedly obtained in secret rebates on slabwood.

The company filed a claim against the estate for $47,404.52 early in December, but the claim has not been allowed by the executrix the company explained in filing suit in the superior court of Cowlitz county.

Prelinger Leaves Crown Zellerbach

● Herbert Prelinger, chemist in the central technical laboratory of the Crown Zellerbach Corporation at Camas, Washington, has resigned to take another position.



The design, construction and equipment of the Crown Zellerbach Corporation's new central laboratory at Camas, Washington, is the result of years of experience in technical control and research in pulp and paper manufacturing.

Crown Zellerbach Completes Central Laboratory at Camas

Modern in design, construction and equipment, the new central laboratory is the center of the Crown Zellerbach Corporation's technical control and research activities.

THE central technical and research laboratory of the Crown Zellerbach Corporation located at the Crown Willamette Paper Company Division mill at Camas, Washington, and under the direction of W. R. Barber, technical director for the corporation, was formally opened December 15th and 16th when J. E. Hanny, resident manager, held open house for residents of the community and for friends from other sections. Several thousand persons inspected the new laboratory and went through the numerous departments of the world's largest specialty paper mill.

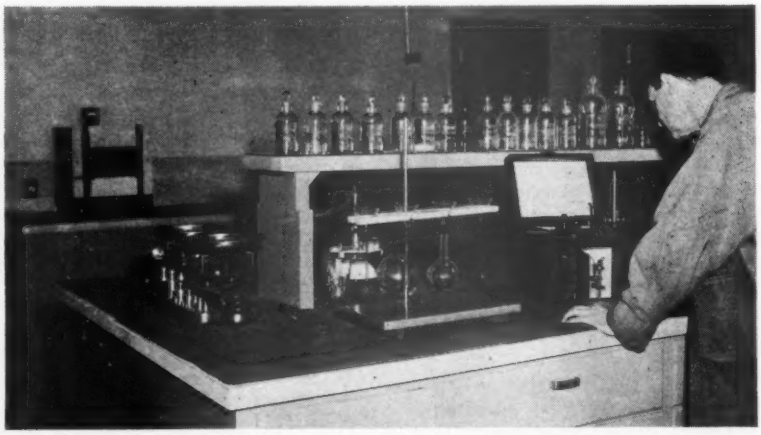
The new laboratory houses the personnel and activities of the central technical control section and serves as the research center for the entire Crown Zellerbach Corporation, including not only the mills and converting plants on the Pacific Coast from Ocean Falls, British Columbia, to Los Angeles, California, but also the plant in Texas and the paper mill at Carthage, New York.

It represents the latest developments in control and research work in the pulp and paper industry. The equipment installed in the laboratory at Camas is of the latest design and provides every facility needed by the staff of experts. The men who are now employing the laboratory's modern equipment to maintain and improve quality, to solve problems involved in the production of pulp and paper and to develop new methods and new products, are highly trained and widely experienced in their several fields.

The accompanying illustrations show some general views of the building and the staff and of some of the specialized laboratories included in the structure.

At the head of the laboratory is W. R. Barber, technical director for Crown Zellerbach Corporation. Mr. Barber is a graduate of Leland Stanford University and possesses a long technical and research experience in the industry. It was under his supervision that the new laboratory was constructed.

The general research laboratory, which measures 23x27 feet, is completely equipped for all types of scientific work that comes under its scope. General and bacteriology research is in charge of R. G. Mispley. The features of the laboratory include glass brick windows, efficient overhead lighting, built-in desks and cabinets, and the usual chemical work benches with acid and fire resisting tops, and the customary scientific equipment.



● The bacteriological laboratory, also under the supervision of Mr. Mispley, is 15x31 feet and includes a sterile room for accurate bacteriological work in growing cultures and noting results under antiseptic air conditions.

The research division of the Western Waxed Paper Company, division of Crown Zellerbach Corp., occupies a laboratory 21x26 feet and is headed by J. B. Hyde. He is assisted in this work by J. B. Brown, E. S. Funk, and B. Weidenbaum. In this laboratory, in addition to the usual research equipment, they have a model waxing and gumming machine which duplicates commercial operation on a small scale. The machine was built at Camas and although the country has been searched for superior models it has been found to surpass any other available. There is also a laboratory office of ample size for the director, measuring 11x15 feet.

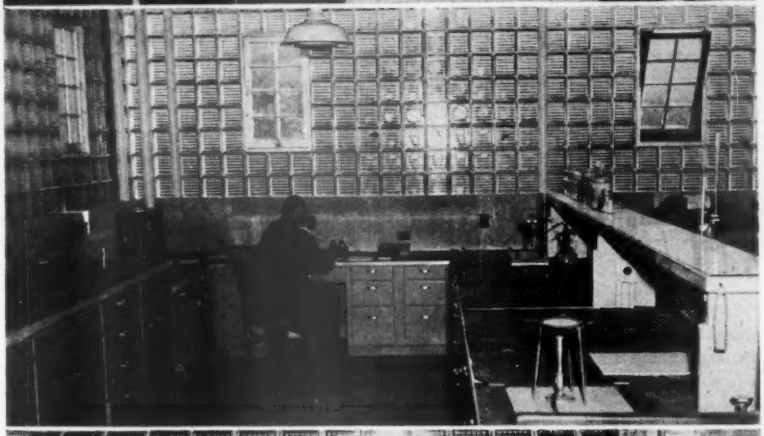
For the use of the various laboratories there is a fine instrument room, 10x15 feet in size, and containing the most modern of precision balances as well as the usual microscopic equipment. It also includes a microtome which will make thin sections of paper or pulp from .010 to .045 for micro-photographical examination.

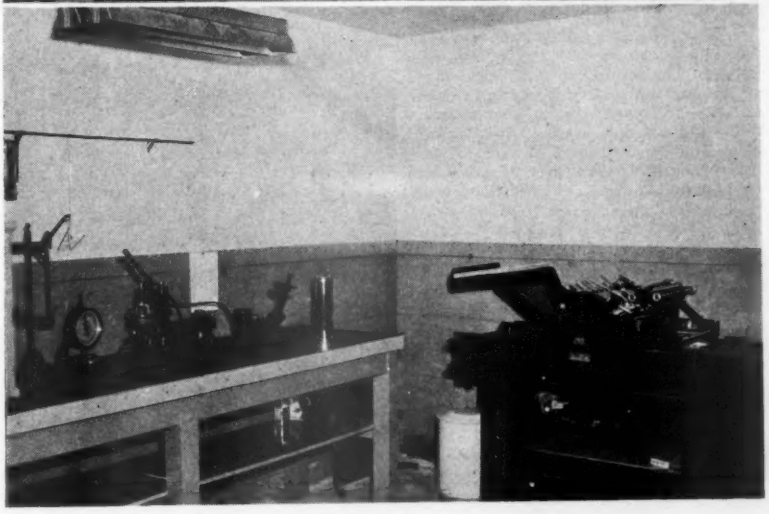
Another feature of interest is the constant humidity room measuring 12x14 feet, in which a constant temperature of 70 degree F. is maintained and a standard relative humidity of 65 per cent. In this room lighting is provided by fluorescent lights, which generate no heat. The room includes the usual type of paper testing equipment such as mullen, micrometer, humidity cabinets, etc., and in addition has a Vandercook proofing press, wax penetrometer, Bausch and Lomb opacimeter, Perkins wax tensile tester, etc.

There are also two cold rooms for the establishment of standard temperatures to duplicate conditions of frozen foods or in refrigerated cars. One cold room has a range of from 25 degrees to 100 degrees F. while the other has a range of minus 10 degrees to 25 degrees F., both with automatic control.

Included in the laboratory is a photographic dark room, which is fully equipped for all phases of photographic work applicable to the research being carried on.

In the building is a research library 11x15 feet in which are glass topped tables, book cases and magazine racks for all the scientific pub-





The CENTRAL LABORATORY STAFF — Seated, left to right: J. H. HULL, R. G. MISPLEY, W. F. HOLZER, B. WEIDENBAUM, W. R. BARBER, Technical Director; J. B. HYDE, LOUISE BAXTER and Mrs. LEONA VAN ARNAM — Standing; H. PRELINGER, D. L. SHINN, T. L. YOKUM and C. S. FUNK.

lications which the staff may have occasion to study.

Last but not least in this building, which measures 120x44 feet, is the director's office, a large and handsome room 15x25 feet with an adjoining office for his secretary and a fireproof vault in which will be preserved valuable records. There are also the usual store rooms, reception offices, etc. The director's office is occupied by Mr. Barber while his department secretary in the adjoining office is Mrs. Leona Van Arnam. Stenographer for the office is Louise Baxter.

Associated with the new laboratory is the experimental pulping unit located near the sulphite mill. Here Walter F. Holzer directs wood pulping research activities, assisted by D. L. Shinn and T. L. Yokum. Newsprint development activities are under Howard Graham, who is resident at the Washington Pulp and Paper Corporation Division at Port Angeles. In charge of research and development of equipment and processes is J. H. Hull.

The new laboratory is built of brick with a large portion of it composed of glass bricks, assuring excellent lighting. The interior walls are of an insulating fibre board in contrasting shades with oak wood work. Floors are of a patterned asphaltic tile. Every provision has been made to make each office comfortable as to sound proofing and air conditioning.

Annual TAPPI Meeting In New York Next Month

● The annual meeting of the Technical Association of the Pulp and Paper Industry will be held at the Hotel Roosevelt, New York City, February 19-22.

Each year one branch or another of the industry predominates in reporting progress, according to the association's announcement, and this year the coated and printing papers fall in that category. Following are the details of the program recording the advances in coating and printing paper manufacture as released on January 2nd:

Meeting of Tuesday, February 20th

Coating Session—9:30 a.m., Frank W. Egan, Chairman.

1. Laboratory Evaluation of Paper Coating Raw Materials, by C. G. Landes.
2. Influence of Body Stock on Coating, by Glenn Davidson.
3. Standard Casein, by W. E. Stringer.
4. Evaluation of Coating Made With Various Pigments, by A. J. Luth.
5. Comparison of Casein, Soya Bean Alpha Protein and Various Starches as Adhesives in the Calcium Carbonate Coating Field, by A. J. Luth.
6. Pulp Colors and Their Use in the Art of Making Coated Paper, by J. R. Brierly.

Meeting of Wednesday, February 21st

Graphic Arts and Coating Session—9:30 a.m., John F. Halladay and F. W. Egan Chairman.

1. The Velo Gold Set Process of Printing and Its Relationship to Printing, by F. G. Breyer.
2. The Hygroexpansivity of Paper, by H. W. Bialkowsky.
3. Improvements in the Printing Properties of Newsprint, by C. A. Sankey and D. G. O. Jones.
4. Product Planning in the Glazed and Fancy Paper Industry, by G. B. Tallman.
5. The Psychophysios of Color, by E. R. Laughlin and I. H. Godlove.
6. Methods of Designating Colors, by D. B. Judd.

Meeting of Thursday, February 22nd

Miscellaneous Papers Session—9:30 a.m., C. E. Curran, Chairman.

1. Prosize, by B. W. Rowland and W. M. Bain.
2. Manufacture and Use of Methocell, by F. C. Peterson.
3. Developments in Synthetic Resins and Resin Emulsions, by F. J. Myers.
4. Plastics and Chemicals from Wood, by R. M. Boehm.
5. The Flocculation and Dispersion of Papermaking Fibers, by A. Erspamer.

● Papers of special interest to engineers will be presented at the February meeting of TAPPI in New York. Following is a list issued by TAPPI early in January.

The Patent Situation by C. W. Rivise

The Rayonier Fernandina Water Treatment Plant by E. Nordell and C. Richheimer

White Water Flow Measurements by R. R. Fuller

Survey of Paper Mill Water Requirements by TAPPI Water Committee

The Wallin and Swenson Circulating System by Sven Fahlgren

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The Economical Disposal of Waste Sulphite Liquor by G. H. Tomlinson and L. S. Wilcoxson

Recovery of Heat in Sulphite Mills by TAPPI Heat and Power Committee

Circulation and Storage of Kraft Pulp by G. A. Petros

Recovery Unit Performance in Burning Kraft Process Black Liquor by L. S. Wilcoxson and F. G. Ely

Design of Gas Absorption Equipment by R. P. Whitney and J. E. Vivian

Maintenance of the Mill to Minimize Dirt and Bacteria by A. P. P. A. Microbiological Committee

Manufacture and Use of Fourdrinier Wire by D. C. Dilley

Welding Stainless Steel by E. W. P. Smith

Paper Mill Construction by H. K. Ferguson and G. W. Dodge

Survey of Kraft Mill Construction Materials by J. A. Lee

Discussion of Packing Material for Pumps

Radiant Heat Drying of Paperboard by R. W. K. Ulm

Drying Rates for Pulp by L. G. Green

The Dowtherm System by Pell Foster

Centralized Lubrication by G. K. Kauffield

The Stream Flow Vat System by P. H. Goldsmith

The Dieckbrader Vacuum Deckle by Yraola

Consistency Regulators by Frederick Wierk

Christensen Joins Fibre Making Processes

● Andreas Christensen of Vancouver, B. C., technical advisor to the British Columbia Pulp & Paper Company for the past several years, resigned on December 1st to join H. W. Guettler of Fibre Making Processes, Incorporated, in the Tribune Tower in Chicago. Mr. Christensen will devote his time to engineering and selling, working on the entire line of equipment handled by the company and traveling over the entire country.

Mr. Christensen, who is a sulphite operator of broad training and experience, came to the Pacific Coast in the Spring of 1934 from the Rhinelander Paper Company. For over a year he was associated with the Grays Harbor Pulp & Paper Company at Hoquiam, Washington, and following this he did some special work for the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, at Camas. Shortly thereafter he became associated with the British Columbia Pulp & Paper Company and participated in developing their modernization program which included the modern bleach plant completed at Woodfibre in 1938.

Mr. Guettler, president of Fibre Making Processes, Incorporated, and Mr. Christensen have worked together for a number of years as FMP handle the sulphite circulating system developed by Mr. Christensen. From his headquarters in Chicago Mr. Christensen will call on the industry in connection with the extensive line of equipment handled by FMP, which includes sulphite and sulphate circulating systems; the Blow steam plant; the Thune filter, which is also employed as a washer, decker and saveall; log barkers, barking drums, and bark presses; knotters; chip dusters and chip cutters; a treatment of condensate from kraft digesters and from evaporators and wash water from diffusers; Bergstrom towers for kraft and soda mills; and also a by-products process for producing turpentine, rosin oil and other chemicals.

In the course of his new work Mr. Christensen will visit the Pacific Coast several times a year. He left Seattle for Chicago by car on January 14th after having visited most of the mills in the Northwest since December 1st. Mrs. Christensen and their son, John, will join Mr. Christensen in Chicago in June after school is out in Vancouver, B. C.

ANDREAS CHRISTENSEN
Leaving Pacific Coast

Wolf Named to Finnish Relief Committee

● The appointment of a pulp and paper Industry Committee to collect funds for Finnish relief, was announced December 29th by D. Clark Everest, president of the American Paper & Pulp Association and of the Marathon Paper Mills Company.

The committee, of which Mr. Everest is chairman, consists of R. B. Wolf, manager, Pulp Division Weyerhaeuser Timber Company, R. C. Mateer, Scott Paper Company; George W. Sission, Jr., Racquette River Paper Company; and J. L. Riegel, Riegel Paper Corporation.

In his announcement of the Industry Committee's appointment Mr. Everest said in part, "We of the paper and pulp industry have more than a sentimental interest in the fate of Finland. Through our contacts with Finnish manufacturers, upon whom we have depended for a substantial proportion of our wood pulp supply, we have learned to know Finland and the remarkable development which the Finnish people have made since their independence.

"I have accepted the chairmanship of an Industry Committee set up for the purpose of collecting funds to be sent to Finland through the Finnish Relief Fund, Inc. I am glad to accept this appointment and I know that the other members of the committee are equally glad to assist in raising funds.

"Among the plans which have been considered for raising funds three seem to have the most merit:

1. Solicitation of direct company contributions.

2. Solicitation of personal contributions from company executives and administrative officers.

3. The collection in small amounts from mill and office employees."

Mr. Everest also points out that contributions by individuals to the Finnish relief fund may be deducted for income tax purposes, provided that, together with other charitable contributions, they do not exceed fifteen per cent of the taxpayer's net income. This is in accord with a ruling of the Treasury Department on December 15th. Corporations may deduct contributions provided such gifts, in total, do not exceed five per cent of the corporation's net income.

Fernandina's New Year's Card of Pine Pulp

● Rayonier Incorporated, manufacturers of dissolving wood pulps, announced the successful placing in commercial production of their new plant at Fernandina, Florida, by sending customers a New Year's card made of the new pulp.

The card, letter size, shows the baby 1940 drawing a toy wagon upon which is a conventionalized drawing of the new mill and is headed "Happy New Year." At the bottom is the Rayonier signature with the statement, "This is a sample of first production from the Fernandina Division."

The new Florida mill is the first plant in the South to produce bleached sulphite dissolving wood pulp from Southern pine. A complete illustrated description will be published in the February number.

Soundview Bleach Plant Ready to Start

● The modernization of the original bleached plant at the Soundview Pulp Company's mill at Everett, which consists of six new bleach cells and auxiliary equipment, is now complete and the unit will be tied into regular production during the week of January 22nd. Construction of this addition to Soundview's bleaching facilities was begun September 18th under the direction of J. H. McCarthy, resident engineer.

With the placing in operation of the new cells the original bleach plant, built in 1930, will be equipped to produce the same qualities of bleached sulphite pulp as have been made in the entirely new bleach plant installed in 1937 when Soundview expanded its pulp production from 200 to 480 tons daily.

Powell River, Pacific Mills Set $50 Newsprint Price

● Powell River Company and Pacific Mills, Ltd., Crown Zellerbach Corporation subsidiary, British Columbia's two newsprint producers, will continue to sell newsprint at $50 a ton for the first six months of 1940, following the example of International Paper Company, which announced its contract price for this year recently.

The two B. C. newsprint companies have fallen in line with eastern mills for several years past, although special rates were made applicable by Powell River Company for the "drought area" paper consumers in southeastern United States one year.

Although Great Northern Paper Mills announced a price of $55 a ton for all 1940, with special discounts, the B. C. mills are tieing in with the majority represented by International.

Chemical and Mechanical Subjects Discussed at TAPPI Dinner

THE dinner meetings sponsored by the Pacific Section of TAPPI from October through May each year, invariably draw large groups of interested men together for the purpose of hearing well-informed speakers discuss subjects of interest to the pulp and paper industry.

The first dinner meeting of 1940 was no exception as eighty-six men were present to hear two papers; "The Chemistry of Plant Products," by Dr. E. V. White, professor of Wood Utilization, University of Idaho, Moscow, Idaho; and, "Advanced Stock Preparation," by Joe Baxter, Jr., of the Shartle Brothers Machine Company, Division of the Black-Clawson Company, Middletown, Ohio.

Dr. White's paper was illustrated with slides. His paper will be published in this journal. Mr. Baxter illustrated his talk with blackboard sketches. Numerous questions followed the presentation of the papers. Mr. Baxter's paper appears in this issue.

Chairman of the Pacific Section, N. W. Coster, presided and introduced the speakers. He announced that the February meeting will be held at the Hotel Monte Cristo in Everett, Washington, on Tuesday evening, February 6th. Dr. A. J. Bailey will present a paper on "Alcoholysis of Wood." Dr. Bailey, who is assistant professor of chemistry and acting director of cellulose and lignin research at the University of Washington, has done much work over the past several years on the pulping of wood with butyl alcohol. The balance of the Everett dinner meeting program will be announced at a later date.

● The success of the dinner meetings over a period of years has caused many to take them for granted, and this is written to remind those who benefit from attending and also those who benefit from reading the papers presented, that the dinner meetings are the result of the unselfish expenditure of much time and energy on the part of the officers of the Pacific Section.

The present officers are carrying on the work started several years ago, continuing to furnish all men of the industry, whether members of TAPPI or not, with the opportunities for instruction and discussion. N. W. Coster is serving his second term as chairman and prior to becoming chairman served in the capacity of vice-chairman. Mr. Coster is technical director of the Soundview Pulp Company at Everett.

Fred A. Olmsted as vice-chairman has the responsibility of planning the dinner meeting programs and securing the speakers. Mr. Olmsted is technical supervisor of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation at Camas, Washington. Fred Shaneman is serving a second term as secretary-treasurer, being elected last June after having been appointed to fill out the term of J. V. B. Cox when ill health forced the latter to retire from office in the Fall of 1938. The secretary-treasurer keeps the records and notifies all members of the meetings. It is a job taking up much time. Mr. Shaneman is vice president and manager of the Pennsylvania Salt Manufacturing Company of Washington at Tacoma.

The Executive Committee, which guides the Section's policies, is made up of the officers, the past chairman and an elected member. The past chairman at present on the committee is George H. McGregor, superintendent of the Longview Mill, Pulp Division, Weyerhaeuser Timber Company. The elected member of the committee is Dr. H. V. Tartar, professor of chemistry, University of Washington, Seattle. The members of the executive committee meet frequently and devote considerable time to discussion of the work of the Pacific Section.

● The interest on the part of men in the industry in these TAPPI dinner meetings is best shown by the distance some of them travel to attend. John Ashby, chief chemist of the Westminster Paper Company, New Westminster, B. C., regularly attends the dinner meetings. To be present at the Tacoma meeting Mr. Ashby traveled approximately 350 miles round trip. Nels G. Lindh and P. S. Simcoe of the National Paper Products Co., came to the Tacoma meeting from Port Townsend, a round trip of 266 miles, while E. D. Rich of the Oregon Pulp & Paper Co., traveled 225 miles each way from Salem, Oregon. Fred A. Olmsted, vice-chairman of the Pacific Section made a round trip of approximately 370 miles to attend the Tacoma meeting. His headquarters are at Camas, Washington.

The following men registered at the Pacific Section dinner held in Tacoma on January 9, 1940.

● Jerry Alcorn, Pulp Division, Weyerhaeuser Timber Co., Everett; Niles M. Anderson, St. Regis Kraft Co., Tacoma; John Ashby, Westminster Paper Co., New Westminster; A. J. Bailey, Department of Chemistry, University of Washington, Seattle; Walter R. Bauman, Pennsylvania Salt Mfg. Co. of Washington, Tacoma; Chauncy Baxter, Tacoma Plumbing Supply Co., Tacoma; Joe Baxter, Jr., Shartle Brothers Machine Co., Middletown, Ohio; C. H. Belvin, Chromium Corp. of America, Portland; W. L. Beuschlein, University of Washington, Seattle; H. K. Berger, Everett Pulp & paper Co., Everett; A. L. Bibbins, Electric Steel Foundry Co., Seattle.

Next TAPPI Dinner At Everett

The February Dinner Meeting of the Pacific Section of TAPPI will be held on Tuesday evening, February 6th, at 6 p. m. at the Hotel Monte Cristo, Everett, Washington.

"Alcoholysis of Wood," will be discussed by Dr. A. J. Bailey of the Department of Chemistry at the University of Washington. Dr. Bailey, who has performed much research on the pulping of wood with butyl alcohol, is Acting Director of Cellulose and Lignin Research at the University.

Vice-Chairman Fred A. Olmsted will announce the second speaker shortly.

Reservations should be sent to Chairman N. W. Coster, Soundview Pulp Company, Everett, Washington.

• F. W. Brainerd, Scott Paper Co., Chester, Pa.; James Brinkley, James Brinkley Co., Seattle; A. M. Cadigan, St. Regis Kraft Co., Tacoma; George H. Cady, University of Washington, Seattle; W. J. Clough, Pulp Division, Weyerhaeuser Timber Co., Everett; Dick H. Cook, Chase Brass & Copper Co., Seattle; N. W. Coster, Soundview Pulp Co., Everett; J. V. B. Cox, Hercules Powder Co., Portland; E. F. Drake, National Paper Products Co., Division of Crown Zellerbach Corp., Port Townsend; A. N. Drips, Everett Pulp & Paper Co., Tacoma.

• George E. Durkee, Rayonier Incorporated, Tacoma Division, Tacoma; Harold R. Erickson, Soundview Pulp Co., Everett; James Fraser, Pulp Division, Weyerhaeuser Timber Co., Everett; Irving R. Gard, Merrick Scale Mfg. Co., Seattle; B. R. Gardner, Pennsylvania Salt Mfg. Co. of Washington, Tacoma; N. O. Galteland, St. Regis Kraft Co., Tacoma; A. S. Gerry, Pulp Division, Weyerhaeuser Timber Co., Everett; William R. Gibson, Northwest Filter Co., Seattle; Harold Griep, Pulp Division, Weyerhaeuser Timber Co., Everett; Kenneth B. Hall, Improved Paper Machinery Co., Noble & Wood Co., Portland; S. H. Harrison, Westinghouse Electric Mfg. Co., Seattle.

• L. R. Hartman, Pulp Division, Weyerhaeuser Timber Co., Everett; A. D. Hawley, Pacific Coast Supply Co., Seattle; Albert H. Hooker, Jr., Hooker Electrochemical Co., Tacoma; G. W. Jay, American Plating Co., Seattle; B. L. Kerns, Westinghouse Electric & Mfg. Co., Seattle; E. E. Kertz, John W. Bolton & Sons, Inc., Portland; R. L. Kettenring, Rayonier Incorporated, Tacoma Division, Tacoma; Frank G. Keuss, St. Regis Kraft Co., Tacoma; John D. Kjome, Scientific Supplies Co., Seattle; Robert M. Kuhn, St. Regis Kraft Co., Tacoma.

• Nels G. Lindh, National Paper Products Co., Division of Crown Zellerbach Corp., Port Townsend; Henry W. Loren, Westinghouse Electric & Mfg. Co., Tacoma; Robert W. Martig, Brown Instrument Co., Portland; A. C. McCorry, St. Regis Kraft Co., Tacoma; A. M. Mears, Pacific Coast Supply Co., Portland; George E. Millard, Chemical Engineer, Seattle; Robert W. Miller, St. Regis Kraft Co., Tacoma; Kyle Milligan, Northwest Lead Co., Seattle; T. E. Moffitt, Hooker Electrochemical Co., Tacoma; Fred Nicholson, Stetson-Ross Machine Co., Seattle.

• F. A. Olmsted, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; Adolf Orup, Soundview Pulp Co., Everett; Frederic M. Pape, Wilson & Geo. Meyer & Co., Seattle; J. W. Peckham, The Bristol Co., Seattle; Paul Pittenger, Pulp Division, Weyerhaeuser Timber Co., Everett; Carl A. Ramstad, Soundview Pulp Co., Everett; Archie P. Ratliff, Jr., Rayonier Incorporated, Tacoma Division, Tacoma; Gordon D. Raught, Pulp Division, Weyerhaeuser Timber Co., Everett; E. D. Rich, Oregon Pulp & Paper Co., Salem; H. A. Rehnberg, Northwest Filter Co., Seattle.

• S. E. Ringheim, Rayonier Incorporated, Seattle; L. B. Robinson, General Electric Co., Seattle; Oliver E. Ronken, Soundview Pulp Co., Everett; H. Radford Russell, Everett Pulp & Paper Co., Everett; Walter A. Salmonson, Simonds Worden White Co., Seattle; B. W. Sawyer, The Foxboro Co., Portland; Ferninand Schmitz, Pacific Car & Foundry Co., Renton; George E. Schmidt, Pennsylvania Salt Mfg. Co. of Washington, Tacoma; Harlan Scott, Pacific Pulp & Paper Industry, Seattle; Brian Shera, Pennsylvania Salt Mfg. Co. of Washington, Tacoma.

• P. S. Simcoe, National Paper Products Co., Division of Crown Zellerbach Corp., Port Townsend; Lawrence K. Smith, Pacific Pulp & Paper Industry, Seattle; P. R. Smith, Everett Pulp & Paper Co., Everett; J. D. Sullivan, Rayonier Incorporated, Seattle; P. E. Sullivan, Ingersoll-Rand Co., Seattle; H. V. Tartar, University of Washington, Seattle; Earl G. Thompson, Great Western Division, Dow Chemical Co., Seattle; H. A. Vernet, A. E. Staley Mfg. Co., Portland; R. O. Vognild, Hooker Electrochemical Co., Tacoma; E. A. Vohs, Pulp Division, Weyerhaeuser Timber Co., Everett.
• William T. Webster, St. Regis Kraft Co., Tacoma; E. V. White, University of Idaho, Moscow; J. M. Wilcox, St. Regis Kraft Co., Tacoma; Stephen N. Wyckoff, Forest Experiment Station, Forest Service, Portland.

Hawley Held Christmas Party

• The Hawley Pulp and Paper Co. held their annual Christmas party for the office force and mill foreman the afternoon of Friday, December 22. Gifts were exchanged between those present.

Brainerd of Scott Paper Visits Coast Mills

• F. W. Brainerd, research and development supervisor, Scott Paper Company, Chester, Pa., came to the Pacific Coast the first week in January. After spending a few days in California Mr. Brainerd extended his trip to the Northwest where he visited a number of the pulp and paper mills.

Mr. Brainerd is a member of the executive committee of the Delaware Valley Section of TAPPI. While on Puget Sound he attended the dinner meeting of the Pacific Coast Section at the Hotel Winthrop, Tacoma, January 9th.

Commenting on the coming Fall Meeting of the national TAPPI in Seattle next August, Mr. Brainerd said, "You have a great many interesting things on the Pacific Coast and the Pacific Northwest in particular that should attract a large delegation from the Middle West and the Atlantic seaboard to the Fall Meeting. The wonderful scenery and natural beauty of this country make a trip worthwhile to see it. From what I have heard of the plans for the convention in Seattle this August it will afford members of TAPPI a unique opportunity to visit the forests and mills that mean so much in the supply of pulp to the American paper industry."

Canadian Newsprint Unaffected by Australian Tariff Changes

• Newsprint is included in Australia's tariff classification A in the new trade restriction setup and for that reason British Columbia's newsprint exports to that country have so far not been affected, according to executives of Powell River Company, Vancouver.

At first, when the announcement of Australia's new tariff and exchange policy was made, it was feared that newsprint might suffer, along with such Northwest commodities as lumber and canned salmon. It is expected that lumber shipments to Australia will be cut at least 60 per cent under the new schedule.

However, newsprint is regarded as "essential" because of inadequate domestic supplies and inability of Australia to obtain newsprint from other sources. Hence, shipments have been maintained. However, the flow of newsprint from British Columbia ports to the south seas has been restricted somewhat by shortage of ship tonnage, and this is a factor that may have an increasing influence as the war continues.

British Columbia mills have been selling about $2,000,000 worth of newsprint to Australia annually on a long term contract which, however, would not have been allowed to stand in the way of government policy had Australia considered newsprint as not indispensable.

Now Grandpa Carl Braun

• It is now "Grandma" and "Grandpa" Carl E. Braun, vice-president and mill manager for the Hawley Pulp and Paper Co. at Oregon City, Oregon. On December 29 an 8½ lb. girl was born to Mr. and Mrs. William Howard Braun and was named Barbara Jean. The young Mr. Braun is employed in the mechanical department of the Hawley mill.

Still Working on Projected Bloedel Mill

• Although representatives of Bloedel, Stewart & Welsh, big British Columbia logging organization, continue silent on the subject, pulp and paper men of the province regard this company as the most likely to make a move this year towards establishing a pulp mill, according to reports from Vancouver.

Members of the Bloedel company admit that engineers have been engaged to make a survey of the project, but state that no plans for actual construction have been made. Unofficially, it is said that a decision in this respect awaits termination of litigation in which Bloedel, Stewart & Welsh are involved with several other logging concerns. The lawsuit, involving several hundreds of thousand dollars, arose from the disastrous forest fires on Vancouver Island in the summer of 1937. Two companies are claiming damages from Bloedel alleging negligence.

If the mill is built it will probably be a 100-ton unit proposition to start with, and the location will be Port Alberni, where the company now operates one of the largest export sawmills in British Columbia.

Bloedel, Stewart & Welsh are among the largest timber holders on Vancouver Island, with extensive pulpwood limits, which, it is argued, could be more profitably converted into pulp than shipped as logs which is now being done on an extensive scale.

Swedish Pulp Engineer Visits British Columbia

• G. S. Borg, of Eskilstuna, Sweden, has been spending several weeks in British Columbia visiting pulp and paper plants and conferring with mill executives.

Mr. Borg made an extensive tour of pulp producing areas in the United States before coming to Canada.

"You have made amazing strides in this country, but I believe that the Swedish industry is far more economical in its utilization of natural resources," said Mr. Borg. "Of course in Sweden and the other Scandinavian countries we have been compelled to be thrifty because of the limited extent of our forests. That incentive has not been so apparent in the Pacific Northwest, although I believe that the future years will show an increasing tendency towards conservation and economy in production."

Mr. Borg, a chemical engineer who installed pulp plants in Germany and Poland as well as in Sweden, says that the war has not yet seriously disrupted the industry in his own country, but he doubts whether such a situation will prevail for long.

Making Groundwood While Water Is High

• The groundwood mills of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation at West Linn, Oregon, and of the Hawley Pulp and Paper Co. across the Willamette river at Oregon City are now operating at full speed. Since early last month there has been plenty of water for all groundwood water power operation and it is expected to continue for some months to come.

Advanced Stock Preparation — Cyclifining

by JOE BAXTER, Jr.*

ADVANCED stock preparation is a great deal like advanced arithmetic—There are several ways to obtain an answer, but usually one way stands out by its simplicity and the rapidity with which the answer is secured. But unlike arithmetic, two plus two, doesn't always equal four in stock preparation, hence, we all have an alibi, in the variables that occur. I'm inclined to think that the first paper ever made, was possibly over hydrated, because paper makers ever since have attempted to make paper with less effort. Better quality with less power, has thus become a goal for everyone.

Consciously or unconsciously, we all become creatures of habit. The man accustomed to thinking in terms of a beater and measuring everything against this standard, will naturally hesitate to change the old order, and when increased capacity is required, will, following the line of least resistance, duplicate his present equipment.

During recent years a new order has come into being—technical men asking: "Why, daddy, why?"

Hence, we find mills no longer bound by habit and "rule of thumb" but actively seeking the reason behind the results.

Stripped of all appurtenances, stock preparation can be summed up to mean: "The adapting of a fiber to a purpose—that of making the desired sheet of paper. All equipment, such as pulpers, refiners, screens and even the paper machine itself is purely incidental.

● There are about four separate functions involved:

1. The use of water to serve as a softener, and as a vehicle.
2. The use of heat to aid the water in penetrating the gelatinous adhesions.
3. The use of chemicals to modify either the fibers themselves or cause some desired result in the finished sheet.
4. The application of mechanical action to the fibers.

*Engineer, Shartle Brothers Machine Company, Division of The Black-Clawson Company, Hamilton, Ohio. Presented at the dinner meeting sponsored by the Pacific Section of TAPPI and held at the Hotel Winthrop in Tacoma, Washington, January 9, 1940.

The uses of water in connection with paper stock are quite well known.

The use of heat can be, and has in most mills, been definitely evaluated.

Chemical reactions and P.H. control have been fairly well standardized.

But when it comes to what happens when mechanical action is applied, we have an enigma. Dr. Siguid Smith was possibly the first to discuss in writing, what he thought happened.

Inasmuch as his theory seemed plausible and no one wrote to definitely refute him, his book has become a classic in his field. I am not here to affirm or refute those theories, but simply to add, what subsequent experience in numerous mills has been. An average of those experiences can be taken to indicate a trend—and that trend is to the cyclifining of stock!

What Is Cyclifining?

● What, then, is cyclifining?

Let's go back to the turn of the century. Paper—all kinds of paper was being made in beaters. True, the jordan had already been invented, but it had not yet found wide spread acceptance except to give the leavening touch to the beaten stock.

At that time, work had already been done on continuous and more concentrated treatment of paper stock. In Lockwood's Directory in 1896 is found **Kelley's machine** for washing and beating paper stock (Figure 1).

Perhaps you wonder why this is brought up? Because Kelley's machine contained elements of cyclifining. Let's examine it. The stock was brought to a pulper by conveyor. This pulper was similar to a Lannoye and was located at the highest elevation. Four separate beater rolls followed at progressively lower levels. Working on the theory that as the stock was further refined, additional water would be needed, he provided water connection at each roll. The last roll discharged directly into the inlet end of a conical refiner, for final treatment. Capacity one ton per hour, with less than one third the power consumed by other methods. History fails to record, to what extent Kelley's machine was used, but a study of that machine reveals some interesting facts.

First, he eliminated to a large extent the circulating of stock by the beater roll.

Second, he ran his stock at high consistency admitting only enough water to serve his purpose.

Third, his machine was compact.

The disadvantages, however, were no doubt, power and low capacity.

The next approach along this line was in Southern Kraft, when a whole battery of jordans were hooked up in tandem to give continuous treatment to this stock. (Figure 2) This system is still being used. Beaters at the same time had undergone very little change. The coupling of several beaters side by side by means of a spiral conveyor, fed by extracting hoods, and with each succeeding roll set closer to the bed plate was a further adaptation of Kelley's machine (Figure 3).

A mill in Wisconsin needed 7-8% stock in their beater, but the roll wouldn't circulate it. By attaching a circulating pump with its suction just back of the bed plate (Figure

JOE BAXTER, JR., Spoke on Cyclifining

4), so the stock simply passed the bed plate and was then withdrawn and returned to the tub on the opposite side of the backfall, results were obtained that prompted further action immediately along this line.

● Better and quicker hydration with less power had been accomplished by one simple expedient—that of reducing the power required to circulate the stock and increasing the consistency as a result.

Earlier in this paper, I mentioned water as a vehicle and water has weight. The heavier the consistency, the less water we need circulate, hence, the less power required for this purpose.

Following the lead, taken in Wisconsin, conical refiners were attached to existing beaters, with the beater roll being used for pulping only—better quicker treatment resulted, based on previous beater performance.

One serious defect was present. There was no definite assurance that all the stock had passed through the refiner.

Tests taken from the beater revealed some flecks of stock had never actually passed through the refiner, while tests taken from refiner discharge had no flecks at all.

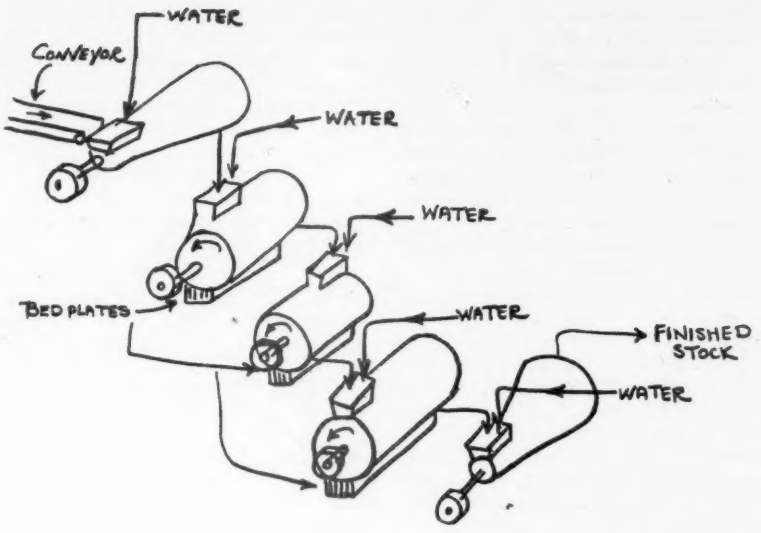
The Miami High Density Pulper

With the introduction of the Miami high density pulper, cyclifining was possible. To pulp at high consistency, draw from this large reservoir of stock and refine at proper consistency with perfect assurance that every fiber was being acted upon. By the trial and error method, it was established that results could be duplicated. In other words, the complete cycle of operations, charging, pulping, refining, coloring, dilution, could all be worked out on a timed basis.

What better name, then, for the equipment doing this work than 'Cyclifiner.'

Thus, it can readily be seen that the introduction of the Cyclifiner is not an accident. It has been carefully planned and studied, and through the co-operation of mills, data has been collected on practically every kind of stock, ranging from filler stock on boxboard, through liner stocks, straw for corrugating and facial tissue.

Over 100 are in operation. From these installations it has become apparent that a pulper in combination with two mid-feather type chests, to which are attached two



KELLEY'S MACHINE
FIG. 1.

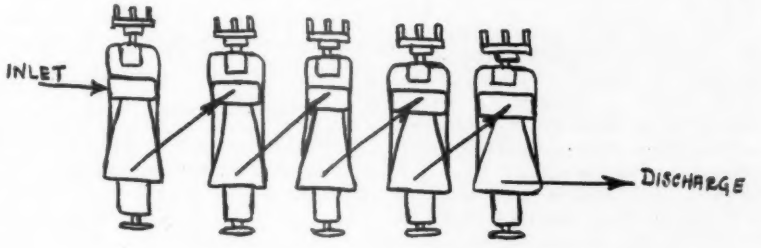


FIG 2.
JORDAN HOOKUP IN TANDEM.

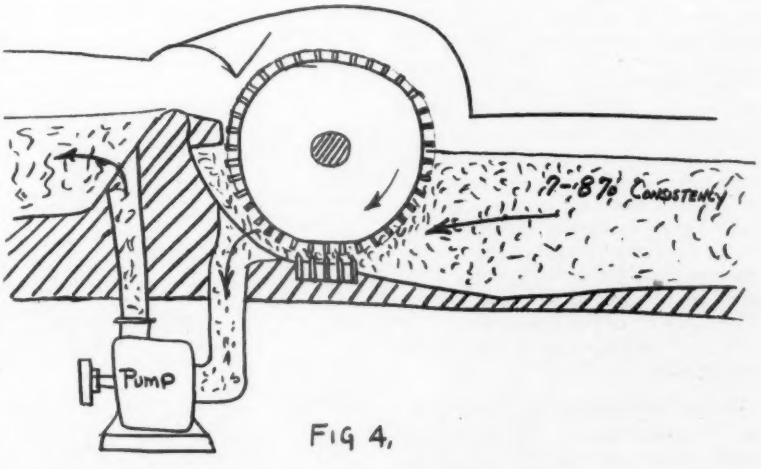


FIG 4.

PUMP ATTACHED TO BEATER
TO INCREASE CIRCULATION
AT HEAVY CONSISTENCY.

cyclifiners gives a most economical arrangement (Figure 5).

Two chests are used because this practically doubles the pulper capacity.

Charge 3,000 to 4,000 lbs. of stock into a pulper, allow to circulate three or four times then dump to chest and start cyclifiner—wash down pulper and change to any other grade or color desired, for the second chest.

Each chest is so constructed that the stock enters the cyclifiner through a large throat opening and is returned to the chest, first into a trough that can be adjusted so that the volume is split, allowing major portion to pass around midfeather, while the balance acts as a submerging stream. The submerging stream acts also to intermix the stock.

By this arrangement, we are assured that every fiber passes through the refiner. It is true some of them will pass through more often than others, but the resulting stock is far more uniform in treatment than can be obtained from beaters.

The degree of refining can be accurately controlled because a definite speed of passage is obtained, hence you can pass once, twice, or as many times as desired through the refiner, simply by starting and stopping refiner on timed cycles. The No. 4 size cyclifiner will handle from 800 to 1000 GPM while the No. 6 will handle up to 2500 GPM depending of course, on the stock.

If we take for example a beater with a roll 56" diameter and 56" face, running at a speed of 120 r. p. m. and a headplate having 8 bars we would secure 1,350,720 square inch contacts per minute, using approximately 60 h.p., at 6% consitency.

On the No. 4 cyclifiner running 860 r.p.m., we secure 25,419,200 square inch bar contacts per minute, or 5½ times the bar contacts per h.p. hour obtained in the beater.

On one test the beater required four hours to reduce the stock 200 cc on Schopper-Riegler tester, while on the same stock only thirty minutes were required with the refiner. The stock from the beater contained flakes of unrefined stock, that from the refiner was clear.

Hydration Imperfect Criterion

● Freeness has for a number of years been the one test on which refiners were evaluated. Recent discussions with mill men bring out the fact that hydration is not a complete criterion.

For instance increased hydration results in slower machine speed, and we find that if mullen and tear can be increased without dropping the freeness beyond certain limits, better and more paper can be produced.

One Northern mill, whose name we are not at liberty to use, tried to use bleached Southern kraft, processing it in their beaters without success. Making a test run through a cyclifiner overcame their problem, to the point, where they now use the cyclifiner for this express purpose.

Another mill ran an interesting test on a furnish of 10% broke, 45% Cornus kraft and 45% Houston kraft. The No. 6 cyclifiner was attached to a beater.

	Mullen	Tear	Freeness
From beater before paper machine jordan	24	243	905
From cyclifiner before paper machine jordan	48	357	895

Beater required 2½ hours—graduated beater roll, 75 h.p. Cyclifiner required 15 minutes using 280 h.p. Thus, beater using 187½ h.p. hours, while cyclifiner used 70 h.p. hours. Note that these tests show a definite increase in both Mullen and tear without appreciable change in freeness.

Fractionation Test

Another test being applied today is that of fractionation, wherein the percentage of fines produced in refining equipment can be ascertained.

A test* run on bottle cap waste shows following results:

	Consistency	Freeness cc	Shrinkage %	R 10	R 20	R 65	R 150	P 150
At end of pulping time	7.2	542	2.5	21	22	31	9	17
6 min. after refiner started	6.7	468	2.7	4	28	37	11	20
11 min. after refiner started	7.0	462	2.7	3	27	37	11	22
16 min. after refiner started	6.4	452	3.2	3	29	36	11	20
21 min. after refiner started	6.7	397	3.2	3	28	34	11	24

*Tests were run on the McNett Classifier.

The large drop in freeness on last sample is due to the fact that it was taken directly from discharge of refiner and not intermixed as were other samples

Still another mill ran tests on Swedish kraft, being made into laps to see (as they put it) if Mullen test would continue to rise.

Time.	Mullen	Tear	Freeness
2 hours	58	315	730
3 hours	67	350	725
4 hours	74	355	720
5 hours	78	355	710
6 hours	82	345	705
	+24	+30	−25

● In the facial tissue installation, the following has been accomplished: Prior to the installation of the cyclifiner they were using two 1700-lb. beaters, each fitted with a 100 h.p. motor, and one jordan using 60 h.p. With this set up they prepared 6½ tons per 24 hours permitting a machine speed of 430 ft. per minute.

Stock was 7% consistency and required 6 hours in the beater to prepare.

A No. 4 cyclifiner was attached to the bottom of one beater. The other beater was shut down. The consistency was reduced to 6%. They now prepare 9 tons per 24 hours—using a cycle of 2½ hours per beater, during which time the beater runs 2½ hours—the cyclifiner 1¾ hours. Machine speed 550 f.p.m.

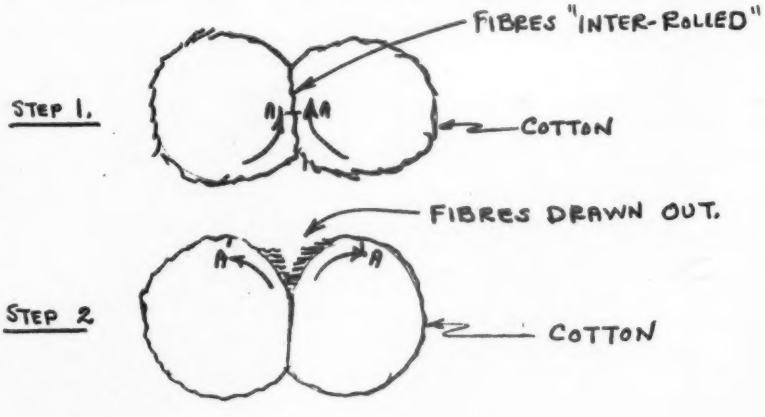


FIG. 6.

Now let's examine the power.

Formerly—using beater

$$\frac{(2\ \text{Beaters} \times 100\ \text{H.P.}) + (1\ \text{Jordan} \times 60\ \text{H.P.}) \times 24\ \text{hours}}{6\frac{1}{2}\ \text{tons}} = 960\ \text{H.P. hours per ton.}$$

Now, using Cyclifiner:

$$\frac{(1\ \text{Beater} \times 100\ \text{H.P.} \times 24\ \text{hr}) + (\text{Cyclifiner} \times 150\ \text{H.P.} \times 16.8\ \text{hrs}) + (\text{Jordan} \times 25\ \text{H.P.} \times 24\ \text{hr})}{9\ \text{tons}}$$

Equals 613.3 H.P. Hrs/Ton

Roughly one-third savings in power. The lower power on Jordan is due to the fact it is now used only for slushing.

Explaining Cyclifiner Action

● The "why" of a cyclifiner.

Trying to offer a lucid explanation of why a cyclifiner does such a good job, is difficult from a purely technical standpoint. We know that certain fillings combined with certain speeds give certain desired results. Just what takes place during the passage of the stock through the cyclifiner, must of necessity be a theory. My inability on this score, no doubt, due to the fact that you technicians haven't as yet told us just what hydration is!

Since we don't know what it is, but do know how to obtain it, let's proceed from that point.

Stock at a consistency above 5% doesn't flow in a strict sense but simply tumbles along, forming little balls that are constantly interweaving and rearranging themselves. In pipe lines, open troughs or beaters, it can readily be observed that those particles in contact with the stationary surface do not slide, but roll, allowing the center or core to roll past at a relatively higher speed.

Bearing this in mind, we start to design our cyclifiner. The inlet openings must not be smaller than 10" diameter else the stock at this consistency will bridge over, unless brought to the refiner under pressure. The cyclifiner of today has these large inlets close coupled to the chest by means of a hopper type throat.

Now that the stock has 'tumbled' into the inlet a propeller is used to aid in feeding the plug. This acts to prevent the plug throwing the water out of the stock and plugging the throat.

We now have the spaces between the shell bars and the spaces between the plug bars filled with this stock—what happens?

If you haven't already swallowed the small wad of cotton at your plate I'd like to have you take it out of your ears now.

That wad of cotton is going to represent a magnified portion of your own stock.

Taking hold of it as I'm doing, tear it into two small pieces observing the number of fibers sticking straight out from the mass. Now, assuming that the cotton in your left hand represents the stock in the shell of a refiner and the cotton in your right hand represents the stock in the plug channels, let's roll them together as per diagram (Figure 6) and pull apart again.

By repeating, we continue to 'draw out 'these fibers. Every time that we 'inter-roll' these bundles, we can straighten more fibers. These fibers thus drawn out represent the fibers being caught between the bars of the cyclifiner.

Owing to the high density and the pressure present within the refining area, an extremely close intermingling is thus obtained and since this 'inter rolling' action is repeated each time a bar passes bar—at 1800 r.p.m., a fiber can be given a lot of work, yet in a gentle manner.

Going back to our statement that heavy density stock rolls instead of flowing, we can understand why channeling in a refiner is impossible.

A sectional view of plug and shell shows that this intermingling of fibers takes place from 7 different surfaces, plus the rupturing force of bar passing bar (Figure 7).

It's all theory gentlemen, but results seem to indicate that it's true in part.

With a cyclifiner attached to a chest, no additional equipment is needed for agitation. The same cyclifiner can be made to deliver to the next stage of operation.

A No. 4 refiner will put a head of 90 feet, on water, dropping to as low as 50 feet on heavy stock.

The design of a cyclifiner chest should come in for its share of discussion (Figure 5). Those of you,

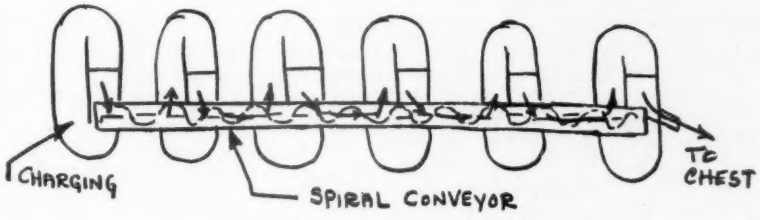


FIG.- 3

BEATERS WITH EXTRACTING HOODS

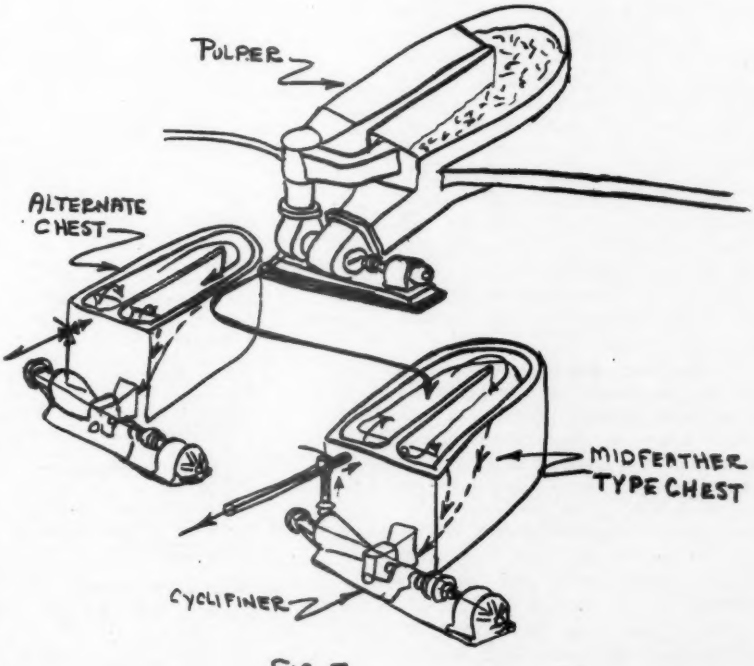
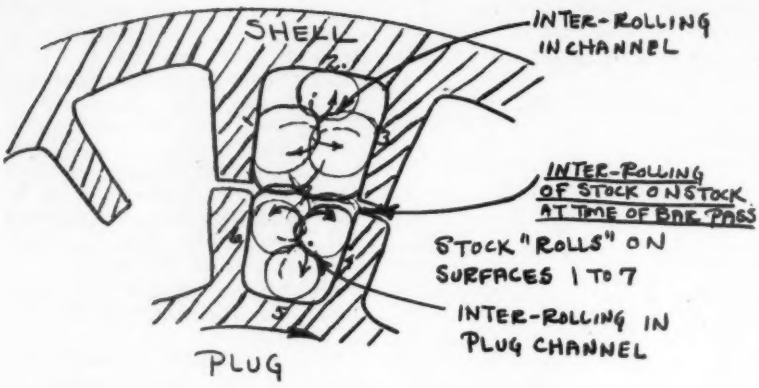


FIG 5


SHELL
INTER-ROLLING IN CHANNEL
INTER-ROLLING OF STOCK ON STOCK AT TIME OF BAR PASS
STOCK "ROLLS" ON SURFACES 1 TO 7
INTER-ROLLING IN PLUG CHANNEL
PLUG

SECTION THRU FILLING

FIG.-7.

familiar, with the agi-flo pump will readily note the similarity, and as a matter of fact, cyclifining did not reach it's present stage of perfection, until chest design had also been given attention. The satisfactory performance of agi-flo installations polnted the way for this development.

There is only one correct way to cyclifine stock—take it out of one end of a chest and return it at the other.

I'll cite a point in argument. One mill wanted to jordan direct to head box which was some distance away. They were pumping into the inlet end of the jordan and to relieve the pressure on the jordan plug they put in a by pass as shown (Figure 8). Trouble began to pile up. Literally. The screen rejects increased, quality and production took a nose dive. The answer — the pump was simply by-passing the jordan and delivering direct to screen.

From this we learned a valuable lesson—that attempting to recirculate a portion of the stock through closed piping so as to cause it to be further reduced by the same medium may be misleading. Better to bring it into a chest and be sure of your results.

It has been said that the success of any endeavor is 'timing.' To time paper making operations, it is necessary to develop 'cycles' of operations. To have each cycle capable of duplication, equipment must be used that gives known results. By constant experiment and checking of results, we have developed five major types of filling for cyclifiners:

No. 1, used for brushing and drawing out the fibers, gives fibrillation, but no cutting.

No. 2, used for brushing where a small amount of cutting is desired.

No. 3, about half cutting and half hydration.

No. 4, gives extreme bruising—resulting in fibrillation and hydration, very little cutting.

No. 5, extreme hydration for glassines or grease proof.

Slight modifications may be necessary depending on stock. The variables we spoke about still prevent a fixed rule by which you simply order a definite filling.

High speed, proper filling, interrolling action of the cyclifiner, all combine to give results difficult to secure otherwise, with the same horsepower and in as little time.

Cyclifining is not essentially new, for it has already been proven. Repeated tests against beaters point to the fact that the beater is passe. We know the principle is right, for the savings are there.

In the final analysis, you men, in the mill, design equipment, we machine builders execute it in the proper materials, drawing from the co-operation of the entire industry.

Gentlemen, you built the Cyclifiner. I believe you'll find, you've done a swell job.

Albert Bankus Nominated For TAPPI Executive Committee

● Albert Bankus, vice-president Crown Zellerbach Corporation, San Francisco, has been nominated for reelection to the Executive Committee of TAPPI.

The nominating committee also named the following candidates for the annual election: Walter H. Swanson, Kimberly-Clark Corporation, Neenah, Wisconsin, for president (to serve one year); Ralph A. Hayward, Kalamazoo Vegetable Parchment Company, Kalamazoo, Michigan, for vice-president (to serve one year); Albert Bankus, Crown Zellerbach Corporation, San Francisco; M. P. Chaplin, Chaplin Corporation, Portland, Maine; G. Lamont Bidwell, Jr., Riegel Paper Corporation, Milford, N. J.; and John L. Parsons, Hammermill Paper Co., Erie, Pa., were nominated for three year terms on the executive committee.

Ballots were mailed to all active and corporate members of TAPPI during the week of December 24th.

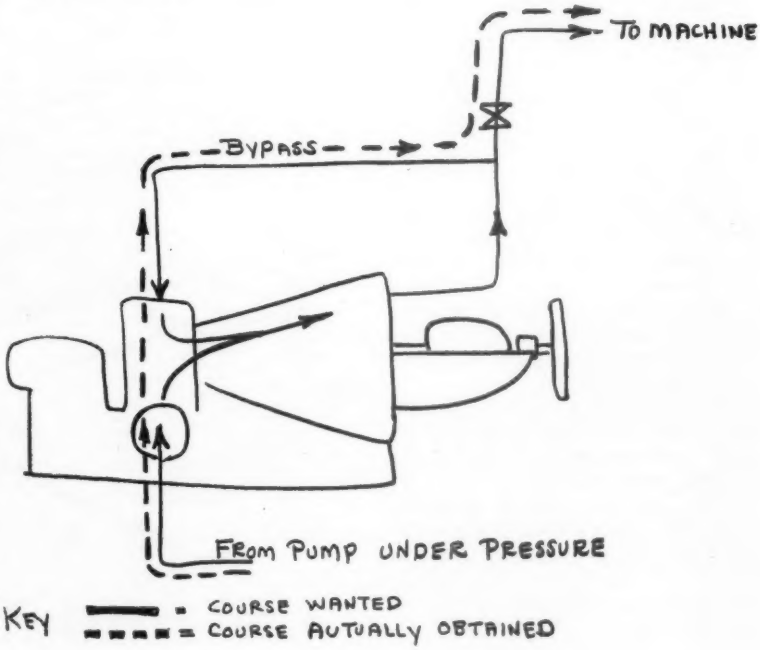


FIG. 8

Ted Cooper Leaving For Tasmania

Will be superintendent of Australian Newsprint Mills, Ltd., at Hobart, Tasmania, upon completion of the plant next September.

• E. W. G. "Ted" Cooper has resigned as assistant paper mill superintendent of the Camas mill of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, and will leave in April for Tasmania.

Mr. Cooper has accepted the position of superintendent of the newsprint mill now under construction near Hobart, Tasmania, by the Australian Newsprint Manufacturers, Ltd. The mill, which will be completed about September was designed by P. Sandwell, Vancouver, B. C., engineer, who is also supervising construction, and is under the general managership of Louis R. Benjamin. Starting with one paper machine the company expects ultimately to install a total of five machines for the production of newsprint and specialties. Details concerning the plans of the Australian Paper Manufacturers, Ltd., will be found in the news story on page 18 of the September, 1939, issue.

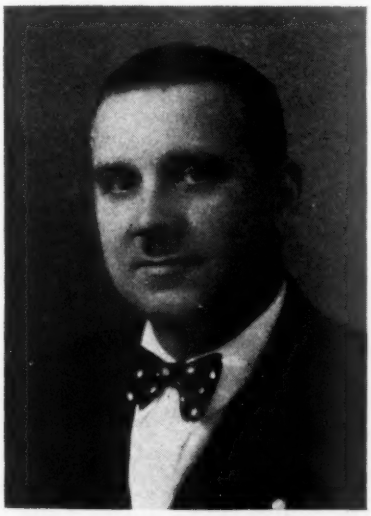
Mr. Cooper possesses unusually broad experience in paper manufacturing. He began working in an English paper mill at the age of 13 and has been active in the industry in England, Canada and the United States ever since with the exception of the period he served with the British army in Egypt, Palestine and at the Dardanelles during the war. Returning to England Mr. Cooper gained wide experience by participating in the modernization of several mills and assisting in starting them off on new paper products. During this period he graduated from the London and city guilds in paper technology.

His first Canadian position was with the Anglo-Newfoundland Development Company at Grand Falls, Newfoundland. The Canada Paper Company of Windsor Mills, Quebec, next obtained his services for the purpose of aiding them in developing specialties, superintending the mill and installing a new type paper machine. His next job of reconstruction was at the plant of the Don Valley Paper Mills. From there Mr. Cooper crossed the border to Potsdam, N. Y., where he became development engineer for the Racquet River Paper Company. In January, 1931, Mr. Coopr accepted a position with the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation at Camas, Washington, and while with Crown he has participated in the development of an extensive line of paper specialties.

Mr. Cooper is a member of the British Technical Association, the American Pulp and Paper Mill Superintendents Association, and of TAPPI. He has served on TAPPI's manufacturing committee and has contributed several important papers, among them being "The Efficient Drying of Paper," which was published in 1929, and "The Cause and Cure of Grainy Edges, Curl and Cockle in Papers," which was written in 1937.

During the past year Mr. Cooper served as chairman of the Pacific Coast Division of the American Pulp and Paper Mill Superintendents Association and prior to that as vice-chairman.

When Mr. Cooper leaves in April for his new position in Tasmania Mrs. Cooper and their son and daughter will accompany him. He will be leaving the Pacific Coast with the best wishes of his many friends in the industry who are happy that this opportunity has come his way, but who sincerely regret that he will be so far away.



E. W. G. "TED" COOPER
To Make News in Tasmania

Sidelights on the Camas Open House

• The open house held by the Camas, Washington, mill of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, proved to be even more popular with the people in Camas and vicinity than was anticipated.

Writing in the Camas Post-Record, editor John Lund commented: "It's a long time since anything has caught the imagination and stirred up enthusiasm of the people of this community as did the Crown Willamette open house last week. Not only did more people make the trip through the mill than had been expected, but they stayed longer than had been expected. Stray visitors were still coming out long after midnight Saturday night—sore footed from much hiking through the 50 acres of buildings—but as enthusiastic as kids with a handful of lollypops.

"The thing that impressed me most was the gay mood of both visitors and workers. Everybody was taking it as a big lark and having more fun than a month of picnics. And the mill management was just as pleased as the visitors. From their viewpoint the open house was such a success that Jack Hanny was talking Saturday about the next open house—some time in the future.

"Right now ought to be a time to start thinking of a paper festival for next summer—such as has been talked of during the past few months. Such a community event would bring thousands of visitors to Camas and if they were given the chance to go through the paper mill we ought to be able to provide them with a bang-up time."

Under sidelights of the open house the Post-Record told several anecdotes of the affair.

"Every available person was put to work as unexpectedly large crowds poured into the mill. Starting out with 62 guides, the list was augmented Saturday until it reached 94. When Vice President Albert Bankus of San Francisco happened into the time office Friday during a rush, he took off his overcoat and went to work signing up guests.

"The nearest anyone came to getting lost in the paper mill was Friday when a visitor seemed to have trouble getting out of the new laboratory building. Finally he went to W. R. Barber the director, and asked:

" 'Are you the boss around this here place?' Getting an affirmative answer, he queried:

" 'Then tell me how you get to the rest of the mill.' Mr. Barber advised him to join the next party that came through. 'That's just what I've been doing,' the man wailed, 'and I've been shown through the laboratory building three times.'

"Evening open house hours were announced as 7 to 9 p. m. but the 'all clear' signal was not given until 1:30 Sunday morning. The last party to start on a tour left the time office at 11 p. m. Saturday.

"At Friday night's open house the last visitors were a trio from out of town. At 12:20 Saturday morning they came to the time office and asked for gas masks so they could 'go up in the sulphite mill.' Someone had said they could go up if they were so equipped. Politely steered away from there, the three visitors decided they'd like to see the groundwood department.

"Half an hour later, at 12:45 a. m., as they were leaving the groundwood operation it suddenly occurred to them they hadn't seen the converting plant. Yes, they must see the converting plant. But their sleepy and footsore guide politely suggested that visiting hours were over until Saturday afternoon."

A total of 4,069 visitors were registered at the open house and it is estimated that several hundred more went through the mill who were not registered.

Roy Carey Speaks Before Camas Paper School

• The Crown Willamette paper school at Camas had its usual vacation between Christmas and New Years, and started out again January 2 with Roy Carey of the National Aniline Co. as principal speaker.

On January 3, Charles Quentel of the C. C. Moore Co., spoke to the fourth year class on the subject of evaporation.

Rayon and other CHEMICAL USES OF WOOD PULP

Rayon Experienced Its Biggest Year in 1939

●On the basis of early estimates, says the Rayon Organon, rayon yarn production in 1939 is expected to mark up a new record. It is estimated that the 1939 figure will be about 20 per cent above the 1938 annual production total. Stated another way, the average rate of productive operation in the domestic rayon yarn industry was nearly 90 per cent of its effective operating capacity during 1939.

Domestic rayon staple fiber production increased approximately 80 per cent from 1938 to 1939, while the imports of rayon staple fiber in 1939 increased by more than 95 per cent over the 1938 total.

The base price for viscose process staple fiber remained unchanged throughout the year at 25 cents per pound and likewise, the base price for acetate staple fiber at 46 cents per pound held during the entire year 1939.

List prices on rayon yarns came during the last four months of the year, continues the Rayon Organon. In September price increases were announced for both viscose and acetate yarns. The increase ranged from 2 to 3 cents per pound, the finer deniers receiving the larger increase. In the following months, additional price increases were made in the finer denier yarns.

While these yarn price increases reflected a tight market situation, it may be pointed out, says the Organon, that the increases in yarn prices were very modest as compared with the recent course of silk and wool prices. In addition, the rayon price structure during 1939 maintained a stability that was the antithesis of the more volatile character of the natural fiber price structures.

The shipments of rayon yarn during the last six months of 1939 reached a new all-time high level for any consecutive six month period in the twenty-eight years of the rayon industry's commercial operation in this country. As a result of the demand, the stocks of yarn held by producers underwent rapid liquidation, and at the end of the year they amounted to less than a week's supply. On the other hand, the year-end inventories of yarn and merchandise held by rayon fabricators and distributors were undoubtedly somewhat larger than those held at the beginning of 1939.

Japanese Rayon Production Exports in First Ten Months

● Production of rayon yarn in Japan during the first 10 months of 1939 totaled 190,351,300 pounds, compared with 173,190,100 in the corresponding period of 1938. Production in October, 1939, increased to 19,542,000 pounds, from 18,835,700 in the preceding month. The output of staple fiber in the first 8 months of 1939 was reported as 175,277,258 pounds, against 217,881,000 in the corresponding period of 1938.

The shortage of pulp has been the primary factor in restricting production, this year, but recently the reduced amount of electric power available (as a result of the drought and insufficient coal supplies) has been responsible for further curtailment.

Rayon yarn exports in October amounted to 3,300,000 pounds valued at 2,600,000 yen, compared with 3,014,000 pounds with a value of 2,272,000 yen in September, 1939. The total shipments abroad in the 10 months of 1939 were 26,089,000 pounds valued at 19,826,000 yen, a considerable gain over the 18,277,000 pounds valued at 14,769,000 yen exported in the corresponding period of 1938. As compared with September shipments, yarn exports to the yen-bloc areas gained 24 per cent during October, but shipments to other countries declined by 5 per cent, with particularly heavy losses in exports to Central America and Africa. (Japanese statistics include Mexico under Central America.)

Exports of rayon textiles in October aggregated 25,200,000 square yards, a decline of 354,000 compared with September shipments; the value advanced in October to 12,200,000 yen, an increase of 91,000 yen which is indicative of the rising price tendency. October exports reflected the effects of hostilities in Europe as shipments to that grand division (as well as to the yen-bloc areas, and North and Central America) moved downward but exports to Africa were 66 per cent higher than in September. The cumulative total of rayon textile exports for the 10 months ended October 31, 1939, was approximately 254,000,000 square yards valued at 110,700,000 yen, compared with 275,574,000 square yards valued at 92,407,000 yen in January-October, 1938, a decline of about 21,000,000 square yards in quantity but an advance of 18,000,000 yen in value. There was a strong upward movement of rayon prices in November. (Office of the American Commercial Attache, Tokyo.)

Rumor Two Rayon Plants For China

● The Japanese Imperial Rayon Company is reported to be forming a Sino-Japanese Rayon Manufacturing Company with a capital of 30,000,000 yen, of which 60 per cent has been subscribed by Japanese interests. Yarn spinning plants are to be established in Soochow and Wusih, the machinery to be imported from Japan, according to local reports (Office of the American Commercial Attache, Shanghai).

Manchukuo Increases Pulp Exports to Japan

● Exports of cellulose pulp during the first half of 1939 increased in weight by 12,200 metric tons and in value by 3,873,000 Manchukuo yuan or 227 and 179 per cent respectively, as compared with shipments abroad in the corresponding period of 1938. The value of shipments during the first six months of 1939 was 6,035,000 yuan (worth $.273) against 2,162,000 in January-June, 1938.

All of these exports are said to have gone to Japan according to the report of the American consul at Dairen, who does not give the total tonnage exported in the first half of 1939, only the increase.

The reported increase in production of recently erected pulp mills (whose machinery is understood to have been imported from Sweden) is expected to enable Japan to reduce its pulp imports from countries which require payment in foreign exchange instead of in yen. Additional mills are under construction.

Plan Another Pulp Mill in Manchukuo

● According to a report of the American Commercial Attache in Tokyo, the Japanese Cotton Spinning Co., has purchased land in North Manchuria for the erection of a large wood pulp factory which is expected to begin operations in 1941.

The soya bean stalk pulp mill at Kaiyuan is said to have been recently completed.

Brazil Considering Plan To Develop Pulp Industry

● After the outbreak of hostilities in Europe the government of Brazil was reported to be considering a number of projects aimed at stimulation of domestic production. Among these, according to the Bureau of Foreign & Domestic Commerce, was a plan to aid Brazilian firms interested in the production of paper pulp from local Parana pine and other base materials.

Carthage Employees Get Service Pins

● A. B. Lowenstein, vice-president of the Crown Zellerbach Corp., San Francisco, presented service pins to 48 employes of the National Paper Co., Carthage, N. Y., Dec. 7.

The presentation took place at an annual service pin dinner, and the awards were for from 5 to 25 years' service.

Offer The Dictionary of Paper

● The American Paper & Pulp Association will publish on March 1st The Dictionary of Paper, the result of three years of compilation by a special committee of the association in cooperation with the Institute of Paper Chemistry.

According to the Association's announcement the book will contain more than 3,500 definitions of pulps, other raw materials, papers, paperboards, paper properties and papermaking terms. Definitions of papers and boards include use, manufacturing aspects, and significant properties.

The Chemistry of Plant Products

by Dr. E. V. WHITE*

THE origin of the various compounds occurring in plant tissue is of course ultimately dependent upon the basic synthesis involving the union of carbon dioxide and water. This reaction, promoted within the plant by energy derived from sunlight, results in mature growth and sets up a storehouse of substances which can be resolved or converted into products of economic value. The mechanism of the synthesis seems to be through the intermediate formation of sugars and, in any event, the long chain molecule of polymerized sugar units is characteristic of plant substances.

The sugars, themselves, represent a large class of chemical compounds which are very similar to each other, yet very different in important respects. The study of such compounds began with the work of Emil Fischer and has progressed until it now represents a well organized branch of chemical science. Thus, following the early investigations by Fischer on glucose, a number of other sugars were found in nature as for example, galactose, mannose, and fructose. These sugars possessed the same empirical formula as glucose but differed in spatial arrangement of hydrogen and hydroxyl groups about the carbon atoms. As a result of careful study, the structural arrangement and characteristics of the simple sugars was determined and they were classed as the monosaccharides.

A most remarkable property of the monosaccharides relates to the elimination of water between molecules to form disaccharides, trisaccharides and other more complex sugar derivatives. The synthesis of cellulose by such a procedure however, is impossible except as performed by the plant. The structure of cellulose is therefore deduced by breakdown rather than by synthesis. Thus, breakdown or hydrolysis of cellulose yields but one sugar which has been identified as a glucose. By a further series of reactions it has been established that the glucose units are linked together by an oxygen bridge to the number one and number four carbon atoms respectively. The number of units engaged in the union is unknown, but is certainly in excess of 200 and possibly 2,000. A measure of the degree of polymerization is given by the viscosity of cellulose in cuprammonium solution.

• It is significant to note in this connection, that none of the present-day cellulose derivatives were available in quantity or quality until the basic structure of the cellulose molecule was determined on the basis of such knowledge the formation of the acetates, nitrates, and ethers can be readily understood and the properties of other derivatives can be predicted with accuracy. Furthermore, the basic structure of the cellulose molecule is constant and that derived from cotton is the same as that obtained from spruce or any other wood. Thus, insofar as chemical utilization of plant products is concerned, no distinction need be drawn between the so-called superior and inferior species. In addition, the natural synthesis is so complex and so complete that there is little possibility of duplicating the natural product in the laboratory or chemical plant.

The mechanism of plant synthesis, however, is not in general as simple as the cellulose example would suggest. The 1-4 linkage is by no means universal and within the same giant molecule a 1-6 or other linkage may occur. Furthermore, not only one but two or more simple sugars and perhaps sugar acids may be found in the products of hydrolysis. This diversity of compounds and of structure renders the entire field rather complex. Nevertheless, the economic utilization of plant products necessitates a knowledge of such structure and fundamental research plays an important role.

DR. E. V. WHITE, Spoke on Chemistry of Plant Products

At the present time it is convenient to classify the constitutents of wood not on the basis of constituent sugars but rather in broad outline according to their most outstanding properties.

The resinous component, 2-5%, is regarded as derived from the isoprene unit which by polymerization yields pinene, pine oil, rosin etc. The origin of the building unit in the plant is difficult to explan although it may represent a degradation product of plant metabolism.

The cellulose fraction has already been considered as a 1-4 beta d glucose polymer of indefinite chain length. This component still remains the most important chemically derived constituent of wood.

The hemicellulose, supposedly cellulose-like, form an interesting group of compounds. Until recently these substances have been investigated only with a view toward their complete removal from the cellulose. In general, the hemicelluloses can be extracted from plant tissue with dilute alkali and like cellulose can be broken down to simple building units. Experimental evidence indicates that the hemicelluloses can be divided into two groups, namely, the polyoses and the polyuronides.

The polyoses yield but one product upon hydrolysis and are similar to cellulose in this respect. Xylan, for example, has been shown to be a 1-4 linked molecule of 18 to 20 xylose units. The polyuronides on the other hand are more complex and usually yield two or more products upon hydrolysis. It is to be noted that glucose, glucuronic acid, and xylose tend to associate together in woody tissue while galactose, galacturonic acid, and arabinose occur together in the annual plants. The structural configuration of the members of each group is identical in the first five carbon atoms and their association is in all probability

*Associate Professor of Wood Utilization, School of Forestry, University of Idaho, Moscow, Idaho. Presented at the Dinner Meeting sponsored by the Pacific Section of TAPPI and held at the Hotel Winthrop, Tacoma, Washington, January 9, 1940.

more than coincidental. Under normal conditions the acidic residues are inactive for the natural products are entirely neutral in character. This suggests that the acid groupings are in some way marked by the mode of linkage.

In contrast, the plant gums and mucilages, which are also of the polyuronide type, are definitely acidic in character. They usually occur as the water-soluble calcium or magnesium salt of the uronic acid, and upon hydrolysis yield several sugars plus one or more sugar acids. These plant constituents can often be hydrolyzed in a step-wise manner to yield valuable information regarding molecular structure. A most remarkable property of the mucilages is that of combining with cellulose in a manner which renders the complex water-soluble. This unusual property is of major interest and suggests water-soluble cellulose derivatives.

In addition to the above mentioned substances, woody tissue always contains from 20-30% of lignin. This faction has received a great deal of attention and, within the last few years, certain advances have been made toward its economic utilization. In consideration of the other constituents of wood, it might be assumed that lignin is of carbohydrate character and in certain measure this may be true. However, such generalizations are often misleading and recent studies indicate an aromatic structure for lignin. The final solution of the problem undoubtedly will permit of more efficient utilization of plant materials.

● Actually, there is available in the natural growth of plants and trees, a huge potential and continuous supply of wealth which is just beginning to receive recognition. Within the past few years, a number of new products have appeared which are based either wholly or in part upon natural plant synthesis. Still further advances undoubtedly will be made in the future.

War Strengthens Canadian Pulp Industry

● War conditions, resulting in increased demand and the curtailment of European competition, have given new stimulus to British Columbia's pulp industry, and new contracts are being closed by British Columbia Pulp & Paper Company, chief producer of bleached sulphite pulp, at advanced prices.

Full extent of the increase has not yet been determined, but it is understood that most of the contracts made this year are for a relatively short term as it is expected that with the war continuing the shortage in supplies will bring about a steadily growing demand with higher prices justified, according to advices from Vancouver, B. C.

Canadian pulp mills have witnessed a greatly improved market situation, especially in the United States, during the last three months. The United States' domestic pulp capacity has been insufficient to meet home demand in certain grades, and the threat that some of the north European countries may be eliminated as a source of supply has placed Canada in a much stronger position.

Well over 2,000,000 tons of chemical and mechanical pulp are imported into the United States annually, and a relatively small proportion has been supplied by Canada. In 1938, the last year for which statistics are available, 88 per cent of the United States sulphite pulp requirements were supplied by Finland, Sweden, Norway, Germany and other European countries. Half of the bleached pulp imports were from the same countries, and nearly 90 per cent of the unbleached sulphite imports were from the same source.

During 1939 the imports to the United States were even greater, but the relationship between the American market and the European pulp producers did not undergo any marked change despite the disruption of trade during the last three months. The pulp situation this year represents an entirely different picture. In the first place, Germany is out of the U. S. market altogether. Finland is no longer in a position to maintain the trade on a regular basis. Norway and Sweden may be able to carry on without any loss of export pulp trade if shipping conditions are stabilized, but even if she does there will be a deficit of nearly 400,000 tons of pulp to be met resulting from cessation of trade with Germany, Finland and other small European countries. There may be no immediate threat of a shortage of pulp in the American market, but the latter will be compelled to place increasing dependence on Canada as a source of supply.

Consumption of pulp in the United States has grown in striking fashion in recent years, and while plant capacity has been enlarged and imports have risen, they have failed to keep step with consumption.

Analysis of the type of pulp required in the 1926-36 period shows a relatively sharp increase in demand for bleached sulphite recently, while unbleached pulp demand has dropped. Over 200,000 tons less of unbleached were used in 1936 than in 1926, which was one of the reasons for conversion of the British Columbia Pulp & Paper Company's plants to the production of the bleached product.

There has, however, been a sharp increase in consumption of unbleached sulphate or kraft pulp, with the result that companies such as Pacific Mills, Ltd., at Ocean Falls has found a much better sale for its product in the United States than formerly. Pacific Mills is now operating at capacity, while both British Columbia pulp mills at Woodfibre and Port Alice are also on full time.

Sigurd Norman Gets Patent on Chipper

● Sigurd Norman, well known pulp mill operator now living in Portland, Oregon, was granted a patent December 12th on his new type chipper which is designed to produce more uniform chips than do present type chippers.

Tht patent, No. 2,183,224, says in part, "The invention herein consists in substitution of a shredding knife or bit with a curved external surface back of the bit edge so that it leads into the material to be shredded with equal lead at all points on its length, so that its "bite" into the material is uniform, the same as the bite of an air screw into the air."

Rex Vincent Inspects Coast Mills

● Rex Vincent, in charge of the Chicago office of Bulkley Dunton Pulp Company, sales representatives for several Pacific Coast pulp mills, was a Pacific Northwest visitor early in January. Included in his trip were calls at the mills of the St. Regis Kraft Company, Soundview Pulp Company and the Puget Sound Pulp & Timber Company.

This was Mr. Vincent's first trip to the Northwest but he plans to make frequent trips in the future for, as he said, he likes the country and the people, and he is finding the mill visits instructive. Prior to joining the Bulkley Dunton organization three years ago Mr. Vincent had devoted his time to the paperboard industry largely in the production department of the business.

Mr. Vincent, together with Milton Bailey of Bulkley Dunton's Kalamazoo office, call regularly upon the paper mills in the Middle West.

REX VINCENT
of Bulkley, Dunton Pulp Co.

Regrinding Machine Knives

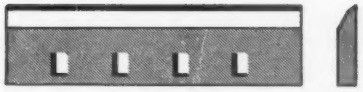
by A. ROUSSEAU*

DURING recent years most knife manufacturers have made improvements in the quality of the steels which they use. Special alloys are employed and the hardening and heat treating are so controlled as to best fit each knife for the class of service intended and to retain the edge as long as possible. As a rule the knives sold today are harder, tougher and naturally more resistant to wear than were the knives in common use a few years ago. It is not surprising therefore that satisfactory results are not always obtained when the users try to regrind these new knives with the same wheels and same methods which were used years ago. Yet many people are still ordering wheels of the same old specifications and are probably trying to use them in the same old way.

This has caused the knife manufacturers a great deal of trouble and the users too for that matter. Not infrequently the knife manufacturers receive complaints to the effect that the edge does not stand up nearly as well after regrinding as did the original edge which came on the knife from the manufacturer. The resultant investigation usually discloses the fact that the trouble is due to the use of improper wheels or grinding methods or both.

The most common fault is the use of wheels which are too hard and too coarse. This is a "carry-over" from the old theory that in order to remove stock rapidly, it was necessary to use coarse wheels and then in order to keep them from wearing away too fast, they were made as hard as could be used without serious burning. The specifications usually centered around 1936-J. While this is not especially coarse nor hard when compared with snagging wheel specifications, it is nevertheless coarser than necessary when we consider the relatively shallow depth of cut usually taken when regrinding knives. It is occasionally necessary to grind out nicks and this means more stock removal than usual, but even then, better results will be obtained if a finer wheel is used.

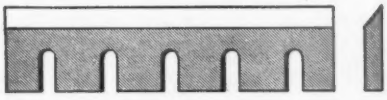
Some grinders seem to be afraid to use a finer wheel for fear it will



CHIPPER KNIFE 10″ to 30″ long.

burn the work. A fine hard wheel will cause burning, but a fine soft wheel will not. The finer grains being smaller and sharper will penetrate the surface of the hard alloy steel more readily than will the larger grains in a coarse wheel. The finer wheel will therefore cut with less pressure and less danger of burning.

In addition to this the finer wheel produces a finer finish on the bevel, making it much easier to hone to a fine edge. A skilled grinder can produce a finish with a 36 grit wheel, but it requires real skill and a man possessing such skill could do a better job and do it more easily with a finer wheel. When the coarse



HOG KNIFE—Representative range is 3″x8″x½″ to 38 13/″x6″x1¼″.

wheel is used to put on a finish, it can only be done by allowing the wheel to get dull and the resulting edge is not always satisfactory. If the wheel is not allowed to get dull, the scratches produced by the coarse grains form minute "nicks" on the edge, which must be honed out by hand.

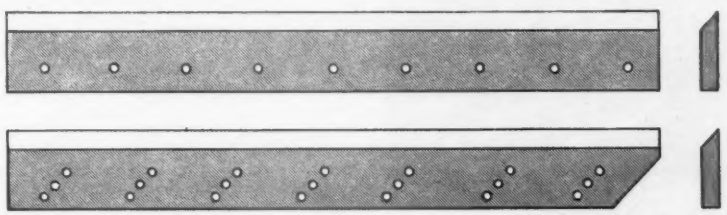
The finer wheel will probably have to be a grade softer. Some may hesitate to use the softer grade, thinking that it will wear out too rapidly. It has been proved many times that such wheels last just as long if not longer than the coarser and harder ones. The reason is that the harder wheels require more dressing and this uses more of the wheel than is lost through natural wear. Even though the wheel did wear a little more, it would be false economy to risk spoiling a large costly knife in order to save a few cents' worth of abrasive material. But let us reiterate that it has been found time and again that the finer and softer wheels which require little or no dressing last just as long as the hard wheels which require frequent dressing.

● There are so many kinds of knives and so many types and makes of grinding machines for grinding them that it is not possible to give specific recommendations for each. It is interesting to note, however, that in knife grinding there is not so much difference between the specifications required for cup wheels and for straight wheels as is usually the case. The reason is that in knife grinding the grinding surface of the wheel, whether it be the flat rim of a cup wheel or the periphery of a straight wheel, is in full contact with the full bevel of the knife. The principal difference is that the cup wheel grinds a flat bevel while the straight wheel grinds a concaved bevel.

More important factors therefore in the selection of the correct grade are the width of the bevel and the grade of steel. The wider the bevel and the harder the steel, the softer should the wheel be as a general rule. Thin blades also require softer wheels and greater care in order to avoid burning.

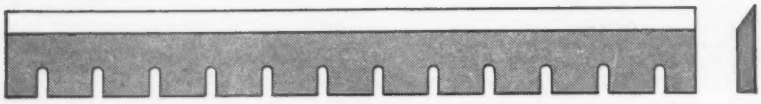
Many of the so-called "cup wheels" are made up of segments. There is also at least one machine utilizing straight wheels which are an assembly of segments. Whether the wheels be "solid" or segmental makes little or no difference in grain and grade selection.

Wheel speed is important and the difference in speeds on different machines is one reason why the same



PAPER KNIVES—Vary from 18″ to over 12′ in length.

*Sales Engineering Department, Norton Company, Worcester, Mass.



VENEER KNIFE—Commonly ranges from 36″ to over 17′ in length.

grain and grade of wheel cannot always be used on different machines for grinding the same kind of knives.

● The following table may be of some assistance in selecting best specifications:

Type of Knife	Wheels in Common Use	Recommended Specifications
Hog, Chipper and Barker Knives	1936-J	1960-I8BE
Planer Knives	1936-J	1960-I8BE
Veneer Slicers	3836-I	3860-H8BE
Paper Knives	1960-I	1970-I8BE

All of the suggestions contained in this article were intended to apply primarily to the regrinding of the newer alloy steel knives which have been brought out in recent years. It is interesting to note, however, that at least one knife manufacturer and a number of users have always advocated the use of fine soft wheels, even for the older carbon steel knives. Therefore, the general suggestion is made that in any shop where wheels coarser than 60 grit are being used, arrangements be made to test a finer and softer wheel.

This article is intended primarily to emphasize the importance of proper grit size. However the matter of an adequate supply of coolant is so important that it also is mentioned here. The flow of coolant should be directed to the point of operation and should be of sufficient volume to keep the knife from "becoming" hot. Quenching it with a trickle of coolant after it is hot is sure to damage the knife and may ruin it entirely. This advice is not new and should be followed regardless of the grit size used, and the use of fine grit wheels does not alter in either way, the need for proper attention to this detail.

SHEAR BLADE—Metal cutting blades vary from 3″ to 15′ in length. Rug cutting blades run to as much as 25′ long.

John Moak In Operating Work at Brunswick

● John H. Moak, who was active in the Pacific Coast industry as a construction engineer from 1929 through 1937, is now engaged in the operating end of the pulp industry as a shift superintendent for the Brunswick Pulp & Paper Company at Brunswick, Georgia. He has been with the company since March, 1938.

The Brunswick Pulp & Paper Company, subsidiary of the Scott paper company of Chester, Pennsylvania, and The Mead Corporation of Chillicothe, Ohio, produces bleached sulphate pulp for these two concerns. The 150 tons per day plant was built in 1937 under the supervision of Otto C. Schoenwerk, consulting engineer, who has constructed a number of mills on the West Coast. The Brunswick mill is currently engaged in an expansion program which will increase production by approximately 50 tons daily.

JOHN H. MOAK, Engineer and Operator

Mr. Moak received his training on the Pacific Coast. He is a civil engineering graduate from Oregon State College at Corvallis, Oregon. His first work in the pulp and paper industry was as a draftsman for V. D. Simons, the late consulting engineer, who supervised the modernization program of the Crown Willamette Paper Company's Camas, Washington, mill which began in 1929 and was completed in 1931. Mr. Moak then went to Longview where the Weyerhaeuser Timber Company's bleached sulphite pulp mill was under construction. When this plant was completed in December, 1931, he went to work in the mill and remained for six months. Mr. Moak joined Weyerhaeuser again in 1934 as a draftsman and in July, 1934, he became associated with Mr. Schoenwerk and continued to work with him through the construction of the Weyerhaeuser Timber Company Pulp Division's unbleached sulphite pulp mill at Everett, Washington, which was completed in April, 1936. On the Everett mill job Mr. Moak worked for Mr. Schoenwerk as an engineer in connection with construction and the installation of the equipment.

Upon the finishing up of the work at the Everett mill, he joined the engineering department of the Soundview Pulp Company, also of Everett, and worked as an engineer under J. H. McCarthy, Soundview's resident engineer, on construction and equipment installation during the expansion program which increased Soundview's daily capacity from 200 to 480 tons of bleached sulphite pulp.

This work was completed in June, 1937, and Mr. Moak rejoined Mr. Schoenwerk as an engineer and remained with him until March, 1938, when he became associated with the operating of the Brunswick bleached sulphate pulp mill.

Longview Fibre Company Erecting New Building

● The Longview Fibre Company of Longview, Washington, manufacturers of kraft paper and board and converters of paper bags and boxes, began construction late in December of a new building to house the company's bag making operations.

It is one story in height, of wood construction with concrete floors and is located east of the main plant. It covers a ground area 130 by 540 feet. The Austin Company of Seattle is the general contractor.

When finished the bag plant equipment will be moved into the new building making room in the old plant for other manufacturing processes.

St. Helens Completes Furnace Installation

● The new Tomlinson furnace was recently finished by the St. Helens Pulp and Paper Company at St. Helens, Oregon.

The new furnace will add about 10 tons to the production of the mill per shift, raising capacity from 120 tons of paper to 130 tons per day, employing 700 men. This unit takes the place of three smaller furnaces which were fed by hand.

Sid Drew Breaks Ankle for Christmas

E. G. "Sid" Drew of Drew & Hoffman, Portland engineers, had the misfortune to break his ankle the Saturday before Christmas.

Mr. Drew will be laid up for the total of six or eight weeks but will be back at his office shortly after the middle of January.

Studies on Waste Sulfite Liquor

III.—Sulfonated Lignin From Waste Liquor As An Emulsifying Agent

by LEO FRIEDMAN and CARL L. LINDEKIN*

IN ORDER to look into the possibility of using waste sulfite liquor as an emulsifying agent for oil-water systems, a preliminary study of the emulsifying properties of the lignin sulfonates obtained by dialysis of a neutralized sample of commercial waste liquor was undertaken. Two different emulsions, benzene-water and kerosene-water were studied.

The waste sulfite liquor used was obtained through the courtesy of the Weyerhaeuser Timber Company, Pulp Division, Longview, Washington. The liquor was heated to boiling and 25 grams of soda ash per liter were slowly added. After standing over night to permit settling, the solution was filtered to remove the precipitated calcium salts. The clear solution was then run through a countercurrent dialyzer using 40 pound parchment paper as the dialyzing membrane. The effluent from the dialyzer, freed from most of the non-colloidal matter, was evaporated to dryness under vacuum on a steam bath. The try residue obtained was readily soluble in water and was used in making the emulsions by dissolving the required amount in the aqueous phase.

The emulsions were made by shaking 30 ml. of liquid in 8 inch Pyrex test tubes closed with cork stoppers. The tubes were fastened in a horizontal position in a mechanical shaking machine in which they were subjected to about 300 shakes per minute. Since the tubes were only about one third full of liquid, this resulted in considerable agitation.

Experiments With Benzene-Water Emulsions

Concentration of Lignin Sulfonate. In order to determine the effect of concentration of the lignin sulfonate on the stability of the emulsions formed, a series of tubes was prepared to contain 10 ml. of benzene, 20 ml. of water, and amounts of lignin sulfonate varying from 0.1 mg. to 1 gram. The emulsions were prepared by shaking for 5 minutes, shutting off the machine for 1 minute, and then shaking for another 5 minutes. The results of this experiment are given in Table I and are shown graphically in Fig. 1.

In every case oil-in-water type emulsions were formed. No stable emulsion was formed when the amount of lignin sulfonate present was less than 1 mg. (about 0.003% by weight) and the maximum stability was reached with 25 to 50 mg. present (0.083 to 0.167% by weight). The extreme efficiency of the lignin sulfonate as an emulsifying agent is well borne out. After 2 hours the emulsions showed very little change, some remaining stable for a week.

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Phase Volume Relationships. Since the phase volume relationship has a marked influence on emulsification, a series of emulsions was prepared in which the total volume in each tube was kept constant at 30 ml. while the amount of benzene was varied from 1 to 29 ml. The amount of lignin sulfonate was kept constant at 50 mg. The results are given in Table II and Fig. 2. The most stable emulsion was obtained when the benzene-water ratio was 1 to 2. The emulsions were treated mechanically in the same manner as above described.

Table I
Effect of Conc. of Lignin Sulfonate on Benzene-Water Emulsions
Benzene = 10 ml., Water = 20 ml.

Lignin Sulfonate mg.	Stable Emulsion after 1 hour ml.	Stable Emulsion after 2 hours ml.
0	0	0
0.1	0	0
0.5	0	0
1	5	1
5	27.5	10
10	27.5	12.5
25	30	25
50	30	22.5
75	29	15
100	16	14
250	15	13.5
500	(a)	13.5
1000	(a)	13

(a) excessive creaming, no measurement possible.

Table II
Effect of Phase Volume Relationship on Benzene-Water Emulsions
Total volume = 30 ml., Lignin Sulfonate = 50 mg.

Benzene ml.	Stable Emulsion after 1 hour ml.	Stable Emulsion after 2 hours ml.
1	2.5	1.5
5	25	6
10	27.5	25
15	22.5	12.5
20	11.5	10
25	7.5	7.5
29	2.5	1.5

Table III
Effect of Phase Volume Relationship on Benzene-Water Emulsions
Total volume = 30 ml., Lignin Sulfonate = 5 mg. per ml. benzene

Benzene ml.	Stable Emulsion after 2 hours ml.
1	1
5	5
10	11
15	22.5
20	15
29	13.0

Table IV
Effect of Intermittent Shaking on Benzene-Water Emulsions
Benzene = 10 ml., Water = 20 ml., Lignin Sulfonate = 50 mg.

Time of shaking. Minutes	No. of 2 Min. rest periods	Stable Emulsion after 2 hours. ml.
2	0	7.5
4	0	12.5
4	1	18.8
6	2	20
8	0	20.8
8	3	21.8
10	0	23.5
10	4	26.5
12	0	23.5
12	5	26.5
18	0	23.5
18	8	26.5

Since the best emulsion was obtained at that benzene-water ratio used in the first experiments to determine the optimum concentration of lignin sulfonate, another series of emulsions was prepared in the same manner as above except that the amount of lignin sulfonate was varied in such a way that there was always 5 mg. of lignin sulfonate present for each ml. of benzene. The results are given in Table III and Fig. 3. In this experiment a definite maximum in emulsion formation was observed at the 1 to 1 benzene-water ratio.

Intermittent Shaking. Emulsification consists of two distinct processes, (1) the breaking up of the two phases into droplets, thin sheets, or threads, and (2) the coagulation of these dispersed phases. For that reason it is generally conceded that an intermittent shaking is advantageous in making emulsions. The rest period of 1 minute used in the above described experiments was put in for that reason. In order to further study the effect of intermittent shaking on these emulsions, a series was prepared in which the shaking machine was run for 2 minute intervals followed by a 2 minute rest period, while for comparison other emulsions were prepared with no rest periods. The results are given in Table IV and Fig. 4. It is to be noted that intermittent shaking did result in improved emulsification, but the gain in these emulsions was only slight. No advantage was gained by shaking for more than 10 minutes whether continuous or intermittent shaking was used.

Experiments With Kerosene-Water Emulsion

Concentration of Lignin Sulfonate. Following the same procedure used in preparing the benzene-water emulsions, a series of emulsions was prepared using 10 ml. of a commercial grade of kerosene and 20 ml. of water with varying amounts of lignin sulfonate as emulsifying agent. The results are given in Table V and Fig. 5. The best emulsions were obtained when 80 to 100 mg. of lignin sulfonate were present in the 30 ml. total volume. Amounts in excess of 100 mg. caused excessive creaming. Oil in water emulsions were formed in every case.

(a) excessive creaming, no measurement possible.

Effect of pH. In order to observe any possible effect of pH upon the emulsifying property of the lignin sulfonate, a series of emulsions was prepared by mixing 10 ml. of kerosene with 20 ml. of aqueous solution containing 60 mg. of lignin sulfonate and varying amounts of hydrochloric acid or sodium hydroxide. The results are given in Table VI. The differences observed are negligible and point to the view that pH has no effect on the formation of kerosene-water emulsions when lignin sulfonate is used as the emulsifying agent.

Summary

Benzene - water and kerosene - water emulsions have been prepared using lignin sulfonate from waste sulfite liquor as the emulsifying agent. Less than one half per cent by weight was found to be sufficient to make good stable emulsions.

The effects of phase volume relationship, of intermittent agitation, and of pH on emulsification in these systems have been studied.

Table V

Effect of Conc. of Lignin Sulfonate on Kerosene-Water Emulsions
Kerosene = 10 ml., Water = 20 ml.

Lignin Sulfonate mg.	Stable Emulsion after 2 hours ml.
20	4.5
30	8
40	11
50	12.5
60	14
70	18.5
80	20
100	20
150	(a)
200	(a)

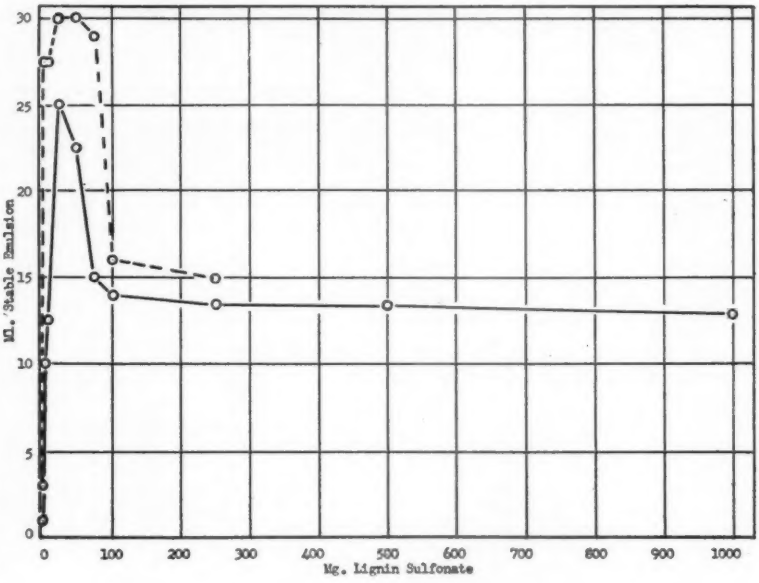


Fig. 1
Effect of Concentration of Lignin Sulfonate on Stability of Benzene-water Emulsions
- - - -Stability after 1 hour ——Stability after 2 hours

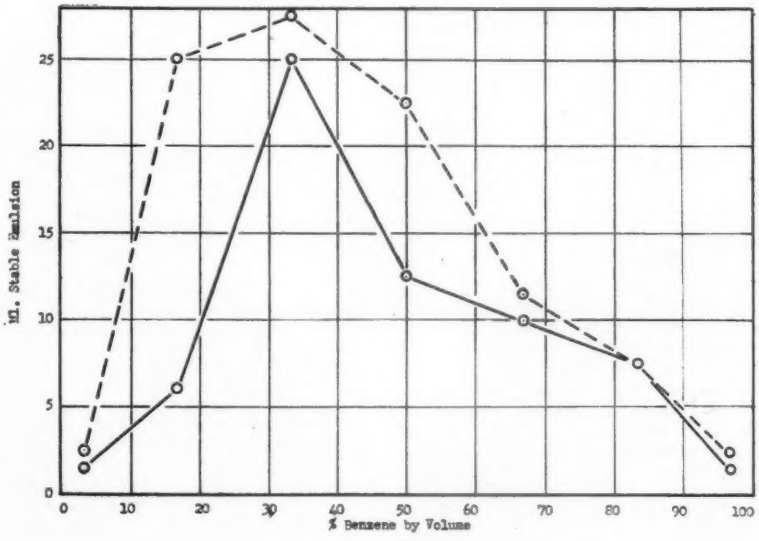


Fig. 2
Effect of Phase-volume Ratio
- - - -Stability after 1 hour ——Stability after 2 hours

Table VI

Effect of pH on the Formation of Kerosene-Water Emulsions with Lignin Sulfonate as Emulsifying Agent

Kerosene = 10 ml., Water = 20 ml., Lignin Sulfonate = 60 mg.

pH	Stable Emulsion after 2 hours. ml.
1.5	13
1.8	12.5
2.3	14
7.5(a)	14
8.0	12.5
9.3	14
10.0	12.5

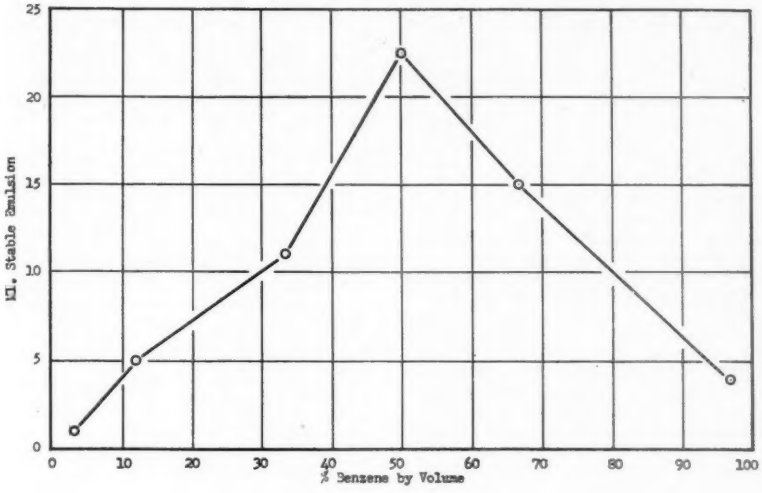


Fig. 3
Effect of Phase-volume Ratio

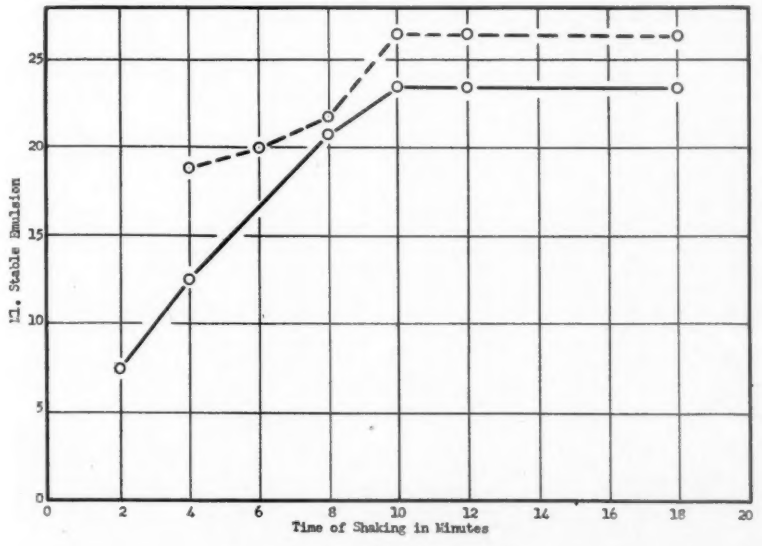


Fig. 4
Effect of Intermittent Shaking

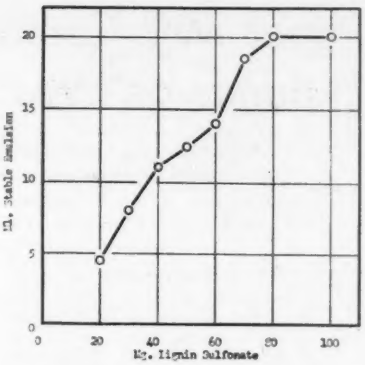


Fig. 5
Effect of Concentration of Lignin Sulfonate on Stability of Kerosene-water Emulsions

Puget Sound Reports Net for September Quarter

● Puget Sound Pulp & Timber Co. reports net profit of $17,153 for the quarter ended September 30, 1939, after all charges, including depreciation, depletion and taxes equivalent to 14 cents a share on 123,637 shares of $20 par 6 per cent cumulative preferred stock outstanding. This contrasts with an indicated net loss of $27,436 in the preceding quarter, and with net loss of $15,437, after all charges, including taxes, depreciation, depletion and amortization for the like quarter of 1938.

Indicated net profit of $2,332 after depreciation, depletion and taxes for the nine months ended September 30, 1939, contrasts with net loss of $69,434 for the corresponding period of 1938.

Sales and railway revenues for the quarter ended September 30 totaled $724,752, compared with $595,246 in the preceding quarter, and $572,736 in the corresponding quarter of 1938. For the first nine months of 1939, sales and railway revenues totaled $1,928,529, compared with $1,104,406 in the corresponding period of 1938, a gain of $824,123, or 74.6 per cent. Deductions for amortization, depreciation, and depletion in the third quarter of last year aggregated $75,673 as against $42,396 in the comparable three months of 1938.

Expanding Shelton Power Plant

● The Shelton Division of Rayonier, Incorporated, and the Reed Mill Company joint owners of the steam and electric power plant located at the Reed company's sawmill are currently busy expanding the plant's steam and electrical energy capacity. Additional boilers at 900 pounds pressure are being installed, as well as another turbine, and a new 125-foot concrete stack constructed. When finished in another month the power plant's electric energy capacity will have been increased by about 5,000 kilowatts. The generating plant is under Rayonier's management.

Besides supplying steam and electric power for the Reed and McCleary sawmills and the pulp mill, the plant furnishes power to the city of Shelton.

Rex Campbell Has a Son

● Rex Campbell, tour foreman at the St. Regis Kraft Company's bleached sulphate pulp mill in Tacoma, became the father of a nine pound six ounce baby boy in December.

Lee Presides at Powell River Christmas Party

● Elmer Lee returned from Seattle to take charge of ceremonies at the Tom and Jerry bowl for Powell River Company on Christmas Eve. Since his appointment to Seattle, friends of the company had wagged their heads, imagining how different things would be at Vancouver head office without Elmer presiding over the hot beverage as had been his custom for years. But Elmer showed up in good time to take charge.

Paper Milk Container Production Expands on West Coast

American Can Company's Los Angeles plant now in operation supplementing production of the company's San Francisco paper milk container plant which started in May, 1939.

RECENTLY completed and set in operation was the new paper milk container plant of the American Can Company in Los Angeles. This modern factory incorporates the latest developments in paper container manufacture and plant construction. It is located on 49th Street near Santa Fe Avenue, on the same tract of land as the American Can Company's Los Angeles tin can plant.

The Los Angeles plant is the American Can Company's second Pacific Coast converting factory for the production of paper milk containers, the first having been established in San Francisco in May of 1939.

Ground was broken for the Los Angeles building May 15th and operations began October 9th, 1939. Facilities in the plant are such to enable production sufficient to supply the maximum demands of the market. One line of converting machinery is now installed and as the market expands additional lines may be added.

Scientific study, supervision and control have been combined to produce the highest standard of sanitation in every step of manufacture of the containers from paper mill to delivery of the container to the users, according to American Can Company officials. At present paperboard is being obtained from eastern mills. Bleached sulphite and bleached sulphate board are both employed in making the milk containers.

On receiving the rolls of board at the container plant the outer layers are completely discarded and a strip from each edge is trimmed off. This insures that no part of the paper board used in the manufacture of the container could possibly have been exposed to bacterial contamination during shipment and storage.

Automatic presses print the paper board and cut it into various sizes of blanks for pints, quarts and other sizes as needed. These blanks then enter the conversion line where they are formed into containers. The seams are cemented with a thermo-plastic, non-toxic resin applied at high temperature. In the forming operation a closure cap is made, which is securely hinged to the top, and cannot be separated from the container.

After the containers have been formed and the seams sealed an automatic machine conveys them through a hot-molten bath of paraffin. In this bath the containers are completely submerged and filled with molten paraffin. On leaving the hot paraffin bath, the inverted containers are drained as they pass through filtered air, maintained at a temperature slightly higher than that of the paraffin bath.

Next, cooling is accomplished by jetting refrigerated, filtered air into the containers while they pass through a chamber containing refrigerated and filtered air. In the course of this operation, as the paraffn cools and sets, the closure caps are sealed tightly in place. All of these operations are performed automatically in an atmosphere of filtered air, in lighted, glass-enclosed machines where complete sanitation prevails.

As the cool, sealed containers emerge from the paraffining machines they are inspected and packed in dustproof paper wrappers or "carriers." These stout paper wrappers are then sealed with paper tape.

Every operator and inspector receives regular physical examinations by registered physicians and daily inspection by registered nurses. Scrupulous personal cleanliness is required.

It has been established by exhaustive research that the several processes in the manufacture of paperboard result in a practically sterile product. The methods of shipping the paper board to the container manufacturing plant, and of fabricating, paraffining, sealing and shipping the containers to the dairy, prevent subsequent contamination.

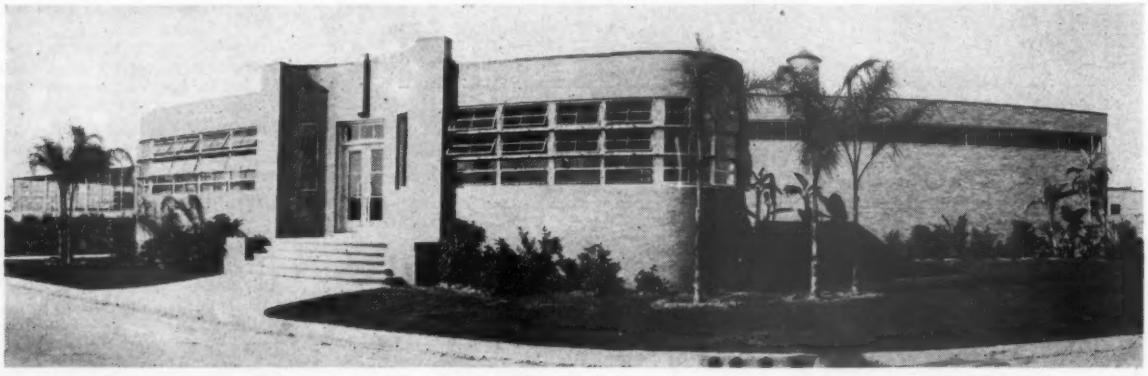
At the Los Angeles plant a fully equipped modern laboratory for the thorough testing of the paper board and the containers when manufactured is a vital part of the production process. Tests are made from receipt of paper board to time of shipping the containers under rigid controls so that the highest standard of sanitation is provided throughout.

Methods of Testing

● As standard procedure in the bacteriological testing of milk bottles, Standard Methods for Examination of Dairy Products (7th edition), suggests two methods: one a rinse method with water; the other an incubation, or culture, method with broth. The procedure for the former test is to introduce 10 milliliters of sterile water into the bottle, then to cap and thoroughly shake the bottle. When low counts are expected and experience shows that it is desirable, the entire 10 milliliters of rinse water is plated. When it is expected that overcrowded plates will be produced by this procedure, two 1 milliliter portions and two 0.1 milliliter portions of the rinse water are plated. Appropriate conversion factors to give the estimated number of bacteria per bottle are used, depending upon the amount of rinse water used in plating.

The broth method is recommended as giving a more satisfactory picture of the real conditions than the rinse method, when the containers are practically sterile. This procedure calls for the introduction of a 10 cc. of standard nutrient broth (composition the same as that of standard agar, with the agar omitted) to each of 50, 100 or even more containers. After the containers are thoroughly shaken, they are incubated at 37° c. for 48 hours. At the end of this period, the number of containers in which the broth remains sterile is noted. The results are reported in percentages of sterile containers.

Of the two alternate procedures for the rinse test, the first mentioned is the more



The new Los Angeles plant of the American Can Company for the manufacture of Canco Paper Milk Containers, which was placed in operation on October 9, 1939.

commonly used with single service containers because the small number of bacteria normally present in single service containers makes the results less accurate when only one or two milliliters of water is placted than when 10 milliliters is plated. Most of the few bacteria in the containers escape detection unless 10 milliliters of water are cultured. Modification of the official rinse method has been employed by some laboratories. In this modification, 20 milliliters of sterile water is used and 10 milliliters plated.

● Bacteria recovered from Canco single service containers in these various tests have been isolated and their types have been studied. E. coli have been consistently absent, according to the American Can Company's laboratory men.

On the basis of continuing series of tests, it has been determined that a large majority of the Canco single service containers for milk yield no viable bacteria whatsoever, and the remainder usually show only a small number per container. These remarkable low counts indicate says the American Can Company that from a public health standpoint the Canco single service milk container represents an important advancement in the sanitary packaging and delivery of milk. This becomes evident when it is recalled that the U. S. Public Health Service Ordinance and Code (1939) stipulates that milk containers shall be so clean that they will not show more than one organism per milliliter, or 946 organisms to each quart of capacity.

The American Can Company leases filling and sealing equipment to dairy users and a combination filling and sealing machine has been developed by the company for this purpose. The filling machine mechanically opens the sealed closure cap of the container, fills the container and hermetically reseals the cap at the rate of 75 quart containers per minute. The resealing operation occurs instantly after filling by a device that closes and expands the plug to form an airtight seal.

Filling and sealing machines are constructed to facilitate cleaning after use. They can be quickly dismantled and thoroughly cleaned and easily reassembled.

After filling, the containers are placed in small lightweight fiber cartons, usually 12 containers to a carton, and then ready for shipping from the dairy to the retail distribution points.

New Bulletin Interprets Fair Labor Standards Act

● The American Paper & Pulp Association has sent to all pulp and paper manufacturers a revision of Interpretive Bulletin No. 4 issued by the Administrator of the Fair Labor Standards Act on December 20, 1939. This supplants the original Interpretive Bulletin No. 4, which has been in effect since October 21, 1938.

The Association has also sent out mimeographed copies of Wage and Hour Questions and Answers to guide manufacturers in applying the provisions of the act to their own businesses. These questions relating to the application of the Fair Labor Standards Act of 1938 were answered by the Chicago Regional Attorney at a recent conference of the American Management Association.

Boyce Says Paper Industry Faces Uncertain Raw Materials Situation

With a capacity sufficient to produce more than 3,000,000 tons of paper annually in excess of any established consumption level, the greatest uncertainty facing the paper industry is whether the entire capacity can be supplied effectively by necessary fibrous materials, according to Charles W. Boyce, retiring executive secretary of the American Paper and Pulp Association, in a statement prepared for the New York Times. Mr. Boyce asserted that this uncertainty became particularly disturbing when Russia invaded Finland, as the latter country normally supplies large quantities of wood pulp.

The stimulation of general business which was expected to follow the outbreak of the war seems to have been postponed, Mr. Boyce asserted, but there was, nevertheless, a marked effect upon the paper and pulp industry. The United States, he added, imported about 25 per cent of its wood pulp requirements, and a large part of it comes from northern European countries.

"Greater cost of shipments, with the increase in both cargo and insurance rates, immediately affected American purchases and tended to stimulate forward buying on the part of paper consumers," he reported, continuing:

"The early rush to purchase other commodities, such as food, required extensive replacement of stock, which drew heavily upon paper production. The general stimulation of merchant business required larger normal stocks. Altogether, the demand during the last quarter of the year lifted production of paper to full capacity.

"The uncertainties which any European war condition is bound to create with respect to wood pulp supplies caused many purchasing mills to turn to domestic producers. As a result the domestic wood pulp industry is also operating at full capacity.

"The rate of operation in the last quarter of the year added to production levels during the first three-quarters of the year, which were fairly comparable with those of 1937, indicates that the production of paper in the United States will in 1939 establish another all-time record.

"The current year's report will be the fourth year in which paper production exceeded the peak of 1929. Although there still exists in the case of most manufacturers a substantial backlog of orders, new orders are tending to drop to or below normal levels. Because of the tendencies for costs to increase, the decline in new orders has not been as marked as was expected and it is anticipated that the industry will run well into the first quarter of 1940 at extraordinarily high rates of production.

"The outlook for 1940 as a whole depends to a marked extent upon the manner with which general business reacts. If rates of industrial productivity are high, the paper industry can expect a good year. It will be measured, however, by the extent to which the general index rises."

November Wood Pulp Exports

● Exports of wood pulp from the United States in November totaled 20,985 short tons valued at $1,076,682. The Washington customs district exported the larger portion of the total with 14,476 short tons valued at $802,916.

The Washington exports were made up of 11,427 tons of rayon and special chemical grades valued at $679,356; 895 tons of other bleached sulphite worth $34,969; 915 tons of unbleached sulphite pulp worth $29,279; 105 tons of unbleached sulphate pulp valued at $4,158, and 1,134 tons of other wood pulp valued at $55,154. This was almost entirely bleached sulphate for which the customs does not as yet have a separate listing.

Nationally the pulp exports in November consisted of: 12,643 tons of rayon and special chemical grades of bleached sulphite valued at $746,908; 1,821 tons of other bleached sulphite worth $91,206; 3,518 tons of unbleached sulphite pulp valued at $115,360; 197 tons of soda pulp worth $10,278; 1,481 tons of unbleached sulphate pulp valued at $47,933, and 1,325 tons worth $64,997.

Roosevelt Enlarges Olympic National Park

● In a proclamation issued January 2nd, President Roosevelt took advantage of the provision in the act creating the Olympic National Park permitting him to enlarge its boundaries by 187,411 acres. The acreage was added on all four sides of the present park.

At the time he issued the proclamation the President stated that a Forest Service survey showed that there is enough remaining timber on the Olympic Peninsula to maintain pulp and paper mills now operating and to permit an expansion of 30 per cent in production.

The park enlargement was made despite the opposition of Governor Clarence D. Martin of Washington and of several civic organizations who opposed taking so much land out of productive use.

Book Paper Hearings Resumed in Appleton

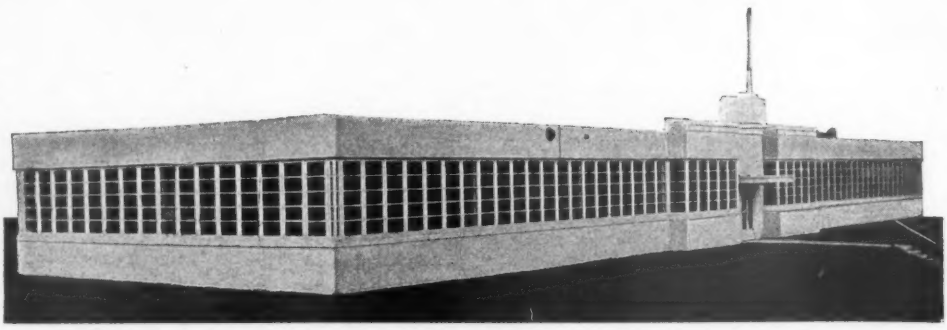
● The Federal Trade Commission hearings on charges against the manufacturers of book papers, were resumed on January 5th in Appleton, Wisconsin.

The Federal Trade Commission has charged the book paper manufacturers with combination and conspiracy to control prices of book papers.

Christmas Present From Sky

● So read the newspaper story of the 3,500-mile flight of Mrs. Joseph La Chance from Seattle to Jacksonville, Florida, to join her husband who is shift superintendent for Rayonier Incorporated. With her were seven weeks old Leon Joseph La Chance and his older sister Mary Ellen.

Mr. La Chance had never seen his young son. He was transferred from the Grays Harbor Division at Hoquiam last October to Rayonier's new mill at Fernandina just a week before Leon was born. The family were all together for Christmas in Fernandina.



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We Cannot Afford Forestry For Fun

Says Professor Bror L. Grondal of the College of Forestry, University of Washington, Seattle, in a talk before the Western Forestry and Conservation Association in Portland December 14th.

THE practice of forestry must be paid for by the consumers of forest products or else it becomes a general charge upon the taxpayers of the nation and is simply a "forestry for fun" proposition, said professor Bror L. Grondal of the College of Forestry, University of Washington, Seattle, in a talk before the Western Forestry and Conservation Association in Portland, Oregon, December 14th.

Professor Grondal's talk opened the discussion of "What Do Research and Experiment Teach Us to be Practicable Better Forestry?" Following are his remarks.

Almost thirty years ago E. T. Allen wrote the first sensible volume dealing with "Practical Forestry in the Pacific Northwest." In Mr. Allen's book he states that the lumberman must consider both the profit of forestry and the popular demand for its practice, and that the consumer must pay for growing timber.

That was thirty years ago. The question today is: "will the consumer pay for the growing of timber"? If he will not pay, who will pay?

Upon previous occasions I have emphasized the patent fact that "forestry for fun" is impracticable. Foresters can talk about silvics, management, fire prevention and suppression, and wax warm over the minutae of the administration of forests, but if the major product of the forest, lumber, cannot be sold in the future at a substantial profit, forestry can only be a "forestry for fun" proposition.

A profitable market for lumber is the only foundation upon which a forestry program can be built. Consumer demand and the price of lumber should be as important to the forester as the price of hogs is to the Iowa farmer. But, unfortunately, this is not the case. A couple of years ago, in arranging a meeting for foresters, the speaker invited a former retail lumber dealer, now a retail association secretary, to deliver the address of the evening. To my great embarrassment, nobody attended — that is, had it not been for a handful of senior and graduate students working under the speaker's supervision there would have been no meeting. Later, a well-known forester remarked to me that the retail lumber business could be of no interest to a forester!

The speaker is deeply interested in new developments in forestry. Kirkland's and Brandstrom's work in selective management in Douglas fir stands, Munger's defense of clear-cutting in Douglas fir, Isaac's basic analyses of seedling growth, Meyer's stastistical analyses of the rates of growth of various species, are all studies of tremendous significance in the future development of forestry in this region, and there are many more recent contributions of great importance. But, lest this talk become a bibliographical list of completed research projects, more cannot be mentioned.

It is important to us, as foresters, to realize that a seedling growing on an area that has been burned over can be dried out or cooked to death by the sun's heat on that one bad summer day that makes a joke of phenological data, regardless of the mathematical accuracy of the methods of statistical analysis that may be employed, but, after all, foresters can face problems like these with some assurance —it's just a matter of the development of proper silvicultural methods that will prevent such losses.

But isn't it of primary importance to us to seek some reasonable assurance that we can sell that seedling, after it has grown to reasonable dimensions, at a profit?

Forest Trees Grow No Apples

● Fruit growers in the Pacific Northwest are cutting down their orchards because apples and pears cannot be sold at a profit. The idea of compelling farmers to grow apples has not yet seized the public fancy, but timberland owners must now be compelled to grow trees that bear no apples!

Obviously, if the growing of timber does not offer a profit to the timberland owner, he will not be concerned about the regeneration of the stand, nor will he exert himself to prevent the destruction of young timber on logged-off land by fire—for if the land remains bare he will not have to pay annually recurring taxes on growing timber which the public may burn up with callous indifference to the effect of fires upon the timberland owner's pocketbook.

The research we need—the practical research that is demanded to make forestry practical—is primarily research that will make the young and old trees return more income. Therefore, the most significant research is that which has made it possible to sell the products of the forest at a greater profit.

The fact that western hemlock can be used for venetian blind manufacture, while a small item indeed, is important to a forester who is forced to leave hemlock as seed trees on a selectively logged area. The fact that hemlock flooring is superior for many purposes, and that with proper sales promotion it should bring a good price, should interest him greatly. Any new development that permits the manufacture of a higher grade of pulp from western hemlock at lower cost will make it possible for the pulp industry to pay a more reasonable price for hemlock logs—therefore, improvements in the bleaching methods used by our pulp mills should be of some concern to the forester. Synthetic substitutes for cellulose in the manufacture of rayon, or rather silk substitutes, and their probable future effect on the markets for western hemlock logs should be regarded as of more than trifling interest to the forester who may be a user of a toothbrush that has bristles of this material.

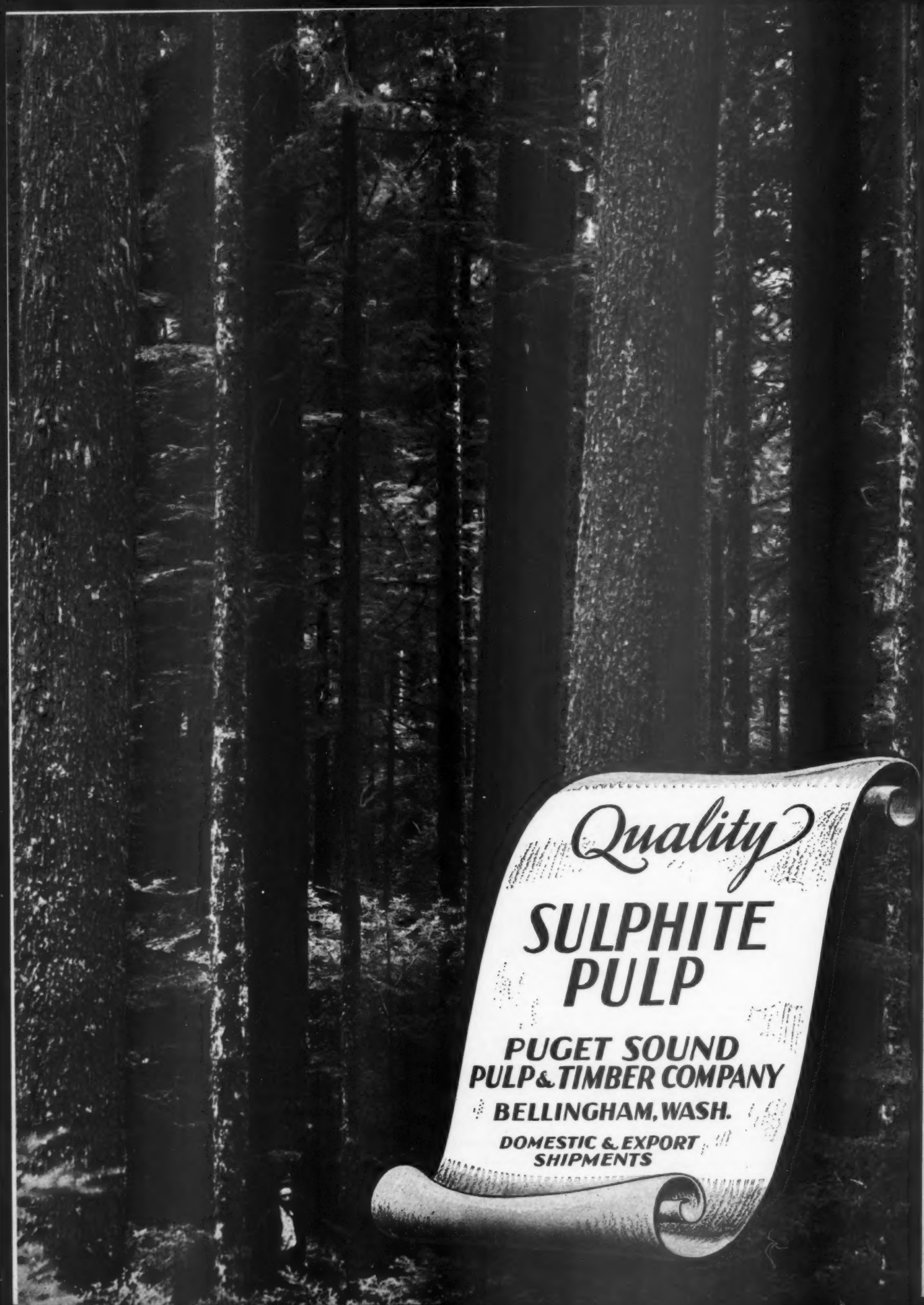
Productive, Practical Research

● Productive, practical research that has created new and real values, and that has helped to prevent the complete collapse of our sagging markets for forest products has resulted in the development of combination timber and concrete highway bridges, originally developed by our wood preserving companies, but vastly improved by other agencies—notably the state highway engineers of Oregon. Ring connectors, which have greatly extended the field of usefulness of wood in construction, are the result of research in Germany and Sweden. The old Powell process, involving the treatment of wood with sugar to prevent checking and to preserve it, which was commercially used thirty five years ago in Australia, has recently been revived for the treatment of wood in dimension control. Old-time salting of timber—used for centuries to prevent decay of wooden ship's hulls, has recently formed the basis for "chemical seasoning" of lumber, although the use of Carbamide—or urea, —now seems to offer greater advantages.

The plywood industry, given new impetus by great improvements in the technique of glueing, coupled with intelligent advertising and sales promotion is still in the market for logs for which it can pay a very substantial price. Laminated construction, which opens new fields in the architectural treatment of wooden buildings, pioneered in Europe, is being brought to a high state of perfection by American firms.

In the manufacture of lumber, much progress has been made in kiln drying—largely as the result of commercial research by a dry kiln manufacturing company located in this city, and the research laboratory of the Western Pine Association has to its credit, among other worthwhile contributions, the development of special methods of wood preservation that

Forestry must be a business proposition, otherwise it isn't forestry. Even though we are, supposedly, wealthy as a nation, we cannot afford "forestry for fun."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SHIPMENTS

have maintained and extended the use of Ponderosa pine. Dipping treatments that prevent the development of sap-staining fungi are now being extensively used. Lumber is being manufactured with greater care—common as well as clear grades are being precision trimmed, end-matched, and beautifully machined at extremely high speeds in machines that are mechanical marvels. Framing lumber is supplied with eased edges, so that it is easier to handle. But, despite all of these improvements, lumber is losing ground—not as fast, however, as would have been the case in the absence of this research.

Questions Value of Government Research

● Government research, concentrated in the huge modernistic building that houses the United States Forest Products Laboratory at Madison, Wisconsin, has not been mentioned—not because some of the basic research that has been conducted there at the cost of many millions of dollars has not been worth while, but only because it has not been fruitful in extending the markets for lumber and lumber products. Rather out-of-touch with such sordid things as wooden shingles and 2x4's, the principal weakness of this laboratory seems to stem from a mistaken impression that popular publicity for the laboratory, rather than close cooperation with industry, will bring continuing appropriations. The treatment of fence posts by the automobile tire method—an adaptation of the Boucherie process invented in 1839—has recently been publicized by the laboratory as a real accomplishment. Much of the data on lumber products emanating from the laboratory has been presented in such a manner that it hinders, and does not help, the lumber manufacturers. Decentralization of this research, so that forest products research is more closely related to the forest, seems to be indicated as the only cure.

While research intended to uncover new products and to create new processes for the utilization of waste is worth while it seems to the speaker that anything that will create new values in lumber, is the real answer to the problem before us. The solution may lie in the production of laminated lumber, eliminating the confusion of grades that so greatly hampers the sale of our construction material. We are producing too many items that are competitive within the industry.

Who Will Pay for Forestry

● Foresters and timberland owners must pin their faith in forestry research, if they are to face the future with assurance. Lumber is not so indispensable that future scarcity will bring high prices. There are too many other competitive materials that are hungering—rather too intelligently for comfort—for markets.

Who will, then, pay for forestry? If lumber and other forest products can not be sold at a price that will make forestry pay, where can we obtain the necessary money? Perhaps our economists, who search and research, can answer this question. There are no apples on our fir trees, but the Public says that we must grow them, "or else!"

I do not mean to hold Mr. Allen responsible for a statement that he made thirty years ago, but it is just as correct today as it was then. The consumer must pay for the growing of timber, just as the consumer, in final analysis, pays for everything. If we can conduct our forest research in such a manner that the consumer, or, in other words, the Public, **wants** to pay we will have an answer to our major problem. Perhaps it will not be necessary to idly watch the creation of National Parks so that the well-to-do who can afford to travel will toss their vacation money to us like tourists throw pennies over the rail to South Sea Island divers. Forestry must be a business proposition—otherwise it isn't forestry. Even though we are, supposedly, wealthy as a nation, we can not afford "forestry for fun."

Port Angeles Christmas Campaign Sets New Record

● For the past 18 years papermen have been playing a big part in bringing joy into the hearts of the underprivileged of Port Angeles at Christmas time, through the efforts of William D. "Beacon Bill" Welsh.

Up to last year Welsh was editor of the Port Angeles Evening News, but resigned to join the industrial relations department, executive offices, Crown Zellerbach Corporation, San Francisco.

Every Christmas "Beacon Bill" would conduct a campaign through his column in the newspaper, raising money for the needy with witty verses and paragraphs about people around Port Angeles. Those who were mentioned in the column were supposed to contribute to the Christmas fund, and they always did. Of course contributions were not limited to just those mentioned in the column.

This Christmas the Crown-Zellerbach Corporation lent "Beacon Bill" to the Port Angeles Evening News again, and this year the "Beacon Bill" Fund topped all previous records, with $5,200 being contributed.

Beside individual contributions papermen of Port Angeles contributed royally to the "Beacon Bill" Fund. The Rayonier boys' hemlock plank steak brought in $826. Washington Pulp & Paper Co. employes contributed $620. Fibreboard Products Inc. employes sent in $221. The Papermakers Ball netted $300, and the International Pulp Sulphite and Paper Mill Workers Union contributed $75.

The money from the "Beacon Bill" Fund is used to buy school children hot lunches, glasses and dental work, and Christmas baskets for the needy.

Seaman Returns From Visit to European Customers

● Stewart Seaman, director of sales for Rayonier Incorporated, with headquarters in New York City, returned December 12th from a month's trip to Europe. Mr. Seaman flew to Lisbon, Portugal, on one of the clipper planes and returned on the liner Rex.

He found conditions far different from those encountered on his previous European trips due to the influences of the war. Passenger service by plane is being continued between Paris and London but the schedules have been reduced to one trip each way per day by each of the two lines, Imperial Airways and Air France. The planes are camouflaged from the top, Mr. Seaman stated, but the windows have not been subjected to the blackout system.

All travelers are thoroughly searched both upon entering and leaving England.

Mr. Seaman found that the theaters in Paris were closed but in London they were open and seats could be obtained only with difficulty. In London he noted that every man, woman and child carried gas masks with them at all times, but the masks were not in evidence in other countries.

Since some English towns are but fifteen minutes away from enemy air attacks there is insufficient time to blackout the lights after an air raid warning, hence the complete blackout every evening. Automobile headlights are covered except for a small opening about the size of a quarter and the light coming through is very dim.

Food rationing had been planned when Mr. Seaman was in London but had not yet been put into effect. The only foods the English appeared to be short of were bacon and butter.

Buildings and monuments are all protected by huge piles of sandbags.

Casualties resulting from motor accidents during the blackouts are said to be greater than those caused by the war to date.

In Belgium Mr. Seaman found conditions quite normal and industry appeared to be greatly stimulated by the war.

Production in France had been seriously effected by the calling of all able-bodied men to the colors, but this situation was being remedied in a great many plants by the release of important technical men from army service. The maximum possible production is being planned by the French rayon industry commensurate with its loss of skilled workers called to the colors. Silk and cotton have been taken over by the government and this action is expected to stimulate the rayon industry.

Bruner Recovering From Back Injury

● Clarence Bruner, resident manager for the Crown Willamette Paper Co., division of Crown Zellerbach Corporation at West Linn, Oregon, recently hurt his back in a fall and cracked a vertebrae. At last reports he was recovering satisfactorily.

Arthur Mears Draws Auto License No. 1

● Arthur Mears of the Pacific Coast Supply Co. has the distinction of having license No. 1 of the State of Oregon on his car for 1940. Mr. Mears obtained this distinctive number at a drawing held in Salem.

Germany Experimenting With New Cellulose Sources

● During 1939 the German staple fiber industry turned to a large extent from spruce to beech wood as principal raw material basis. Extensive tests also have been made with pine and other kinds of wood. However, as it is desirable to reduce the consumption of wood for staple fiber production, further sources of raw materials were sought. Research tests carried out with straw have reached such a degree of perfection that it is claimed that at least one staple fiber works has already adopted straw as a basic raw material. Another development is the experimental use of Italian reed, which has been planted in Germany in test patches. The main advantage of this raw material, aside from avoiding the "bottle neck" of wood supply is claimed to be the enormous per-acre growth of cellulose, which is said to be at least 10 times that of timber.

Another possibility for saving wood is visualized in the use of potato plants for the production of paper. It has been estimated that one-half of the annual German growth of potato plants would suffice to supply the entire domestic requirements for newsprint and graphic paper.

Additional sources of raw materials for synthetic fibers are albuminous substances (casein and fish albumen), coal, and lime.

Information concerning the preliminary work which has been carried on with respect to the utilization of hemp and flax scourings in the production of cellulose has just been released. The main use of this waste material hitherto has been as fuel for heating the kettles of the hemp and flax retters. In professional circles it is estimated that at least 100,000 tons of flax and 30,000 tons of hemp scourings can be collected annually in greater Germany. Allowing for a cellulose content of about 27 per cent, an annual production of 30,000 tons of cellulose could be obtained from this source. This is a much larger quantity than the annual raw material consumption of a regional staple fiber factory. Similar to straw, the cellulose produced from these scourings is rather short in fiber and therefore the working up into staple fiber would perhaps be more expedient than its utilization as a paper-making material. Various methods of utilizing this material have already been worked out. The chief difficulties arising are less of a chemical and technical than of an economic nature. However, greater attention will be paid to the utilization of the collected scourings because a further expansion in the cultivation of flax and hemp in Germany is to be expected.

Another possibility of utilizing this waste material is in the production of light building sections and slabs. The production of these materials already has been started and a number of settlers' houses have been built with them. This way of utilizing the scourings is very favorable to Germany's national economy because it helps to economize in wood.

The decision as to how the flax and hemp scourings will be utilized in the future will depend entirely upon the economic factor because even under war conditions economic resources must be exploited as rationally as possible. (Office of the American Commercial Attache, Berlin.)

Pulp Prices Skyrocket In France

● The American Consul at Nantes, France, reports that although market quotations on wood pulp have not been available since the first of September those fixed by customs officials for evaluation purposes indicate an increase in pulp prices of nearly 145 per cent. A contributing factor to this precipitate rise is, of course, the drop in the value of the franc.

Some French paper mills are reported to have sufficient stocks of wood pulp to last nearly a year but those employing bleached pulps are said to be facing drastic curtailment or complete shutdown.

Spain Short of Wood Pulp

● Reports coming from all sections of the country indicate that there is a serious shortage of wood pulp in Spain. This market in the past has been supplied almost entirely by northern European pulp producers. The current situation, however, is by no means indicative of the inability of northern manufacturers to sell to Spain. The Spanish government, in an effort to conserve foreign exchange for the purchase of materials which can be directly employed in reconstruction work, has found it impossible to permit the import of many commodities which, previous to the Spanish civil war, were imported from overseas sources in large quantities. (Office of the American Commercial Attache, San Sebastian.)

Pulp Market In Chile

● Chile's dependence upon the import of pulp for paper manufacture has engaged the attention of private and Government interests for some years past. There is at present only one company manufacturing mechanical pulp in Chile, and 1938 production was estimated at 21,200 tons. No chemical pulp is manufactured in Chile, although there is at present under construction a factory at Valdivia which hopes to begin production in the near future. Imports of mechanical and chemical pulp have been as follows:

Imports of Mechanical and Chemical Wood Pulp

Country of Origin—	1937 Gross Quintals*	1938 Gross Quintals*
Totals	118,796	137,423
United States	655	8,683
Sweden	113,123	
Finland	4,612	1,706
Norway	406	127,034

*Quintal equals 220.46 pounds.

In the trade it is considered doubtful whether the government of Chile can be successful in promoting the manufacture of pulp. Even if successful, the current trade interests of the United States would not be seriously affected, inasmuch as we are decidedly a minor supplier in this trade. (Office of the American Commercial Attache, Santiago.)

Fagan Elected Chamber of Commerce Director

● James P. V. Fagan, manager of the Puget Sound Pulp & Timber Company's Anacortes, Washington, mill, was recently elected a director of the Anacortes Chamber of Commerce.

Fred Shaneman Named Bank Director

● Fred Shaneman, vice-president and manager of the Pennsylvania Salt Manufacturing Company of Washington at Tacoma, was elected a director of the Puget Sound National Bank of that city on January 9th.

Mr. Shaneman is secretary-treasurer of the Pacific Section of TAPPI.

Puget Sound Pays Preferred Dividends

● On December 23rd the Puget Sound Pulp & Timber Company paid two dividends of 30 cents each on the 6 per cent convertible cumulative preferred stock of the company, outstanding, to stockholders of record December 15th. This payment represents the cumulative dividends ordinarily payable April 1st and July 1st of 1939. The directors were scheduled to meet again in January to decide on payment of the October preferred dividend.

Crown's Industrial Relations Men Gather in San Francisco

● An industrial relations department conference on safety, social security, and other activities was held at Crown Zellerbach Corp. headquarters, San Francisco, Dec. 27-Jan. 2, under the direction of A. R. Heron, industrial relations director of the corporation.

Those present were J. M. Tedford, Camas; Martin Mammen, safety supervisor, Crown Zellerbach and Rayonier Inc., Portland; Otto Hartwig, social security consultant, Portland; Mr. Heron, and San Francisco members of his staff.

Hawley Starting New First Aid Class

● The Hawley Pulp and Paper Co. is starting another first aid class in the middle of January. By the time this course is finished, every employee in the mill will have had this training under Kenneth Urfer, personnel and employment manager, with the assistance of a special instructor.

Foley Spends Christmas In Vancouver

● For the first time since taking over the executive vice-presidency of Powell River Company, Harold A. Foley stayed in Vancouver during the Christmas and New Year's season. Usually he goes to the family home in Foley, Florida, for a reunion. The fact that Powell River Company is busier than it has been for years, operating on a six-day week basis, had something to do with Mr. Foley's decision to stay in the Northwest. From the standpoint of weather, he had no regrets up till the cold spell of early January.

Puget Sound Holds Christmas Party

● The Puget Sound Pulp & Timber Company held its annual employees banquet and dance at the Leopold Hotel in Bellingham on December 26th. Approximately 600 employees and members of their families attended. Lawrence Turcotte, treasurer of the company served as toastmaster.

Taylor Returns to Japan for Rayonier

● Frederick C. Taylor, Rayonier Inc. sales representative in the Orient, sailed for Kobe, Japan, Jan. 6 after spending six months in the United States and South America. Previous to leaving for the Orient, Taylor had just completed a 15,000-mile airplane trip through South America for business reasons.

Lebanon Men Win First Aid Certificates

● Twelve men from the Lebanon, Oregon, mill of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation were awarded first aid certificates on December 13th after having passed the examinations following a course in first aid.

The certificate winners were Robert Primrose, Ronald Hobson, L. W. Boots, Lester Whinery, Layton Loftin, Fred Pierce, Ross Whinery, Charles Fomherz, Frank Karpinski, E. L. Merchant, Pete Dickie and R. V. Grusing.

The instructor of the classes, held weekly, was John Simi.

Coos Bay Makes Large Water Shipment to East Coast

● The first water shipment of unbleached sulphite pulp from the mill of the Coos Bay Pulp Corporation at Empire, Oregon, to Atlantic ports, was made on January 10th, when the S. S. San Simeon was loaded with 600 tons. Previously most of the shipments had been by rail to the Middle West.

The Coos Bay mill resumed operations on September 17th, 1939, after being idle from December 24, 1937. During operations in 1937 most of the output was shipped to Japan. At the present time the production is being taken by domestic paper mills and the company has orders for a long time ahead.

Vic Gault Now Answering to "Skinny"

● Vic Gault, personnel manager for Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, at Camas, is now being called "Skinny" Gault, according to A. G. "Buff" Natwick.

Put New Head Box Slice On Number 11 Machine

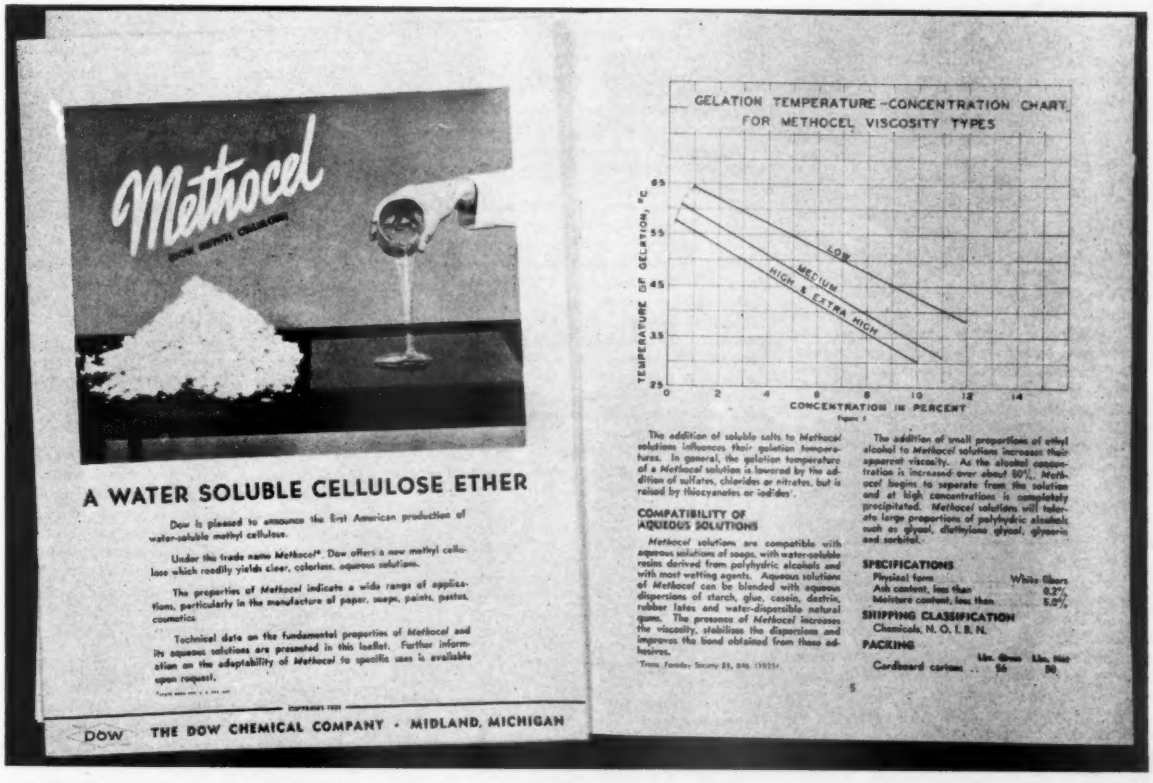
● A new head box and slice was put on No. 11 machine of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, at Camas, over the Christmas holidays. The new equipment gives higher speed and better quality at the same time.

It was purchased from the Beloit Iron Works and included a Valley Iron Works high inlet slice.

Lebanon Holds Open House

● On December 12th the Lebanon, Oregon, pulp and paper mill of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, held open house for about thirty business and professional men of the city.

Resident manager Paul Middlebrook conducted them on a thorough tour of the mill and explained the various processes.


Methocel
A WATER SOLUBLE CELLULOSE ETHER
Dow is pleased to announce the first American production of water-soluble methyl cellulose.
Under the trade name Methocel*, Dow offers a new methyl cellulose which readily yields clear, colorless, aqueous solutions.
The properties of Methocel indicate a wide range of applications, particularly in the manufacture of paper, soaps, paints, pastes, cosmetics.
Technical data on the fundamental properties of Methocel and its aqueous solutions are presented in this leaflet. Further information on the adaptability of Methocel to specific uses is available upon request.
DOW THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN
GELATION TEMPERATURE-CONCENTRATION CHART FOR METHOCEL VISCOSITY TYPES
TEMPERATURE OF GELATION, °C.
CONCENTRATION IN PERCENT
LOW
MEDIUM
HIGH & EXTRA HIGH
COMPATIBILITY OF AQUEOUS SOLUTIONS
SPECIFICATIONS
SHIPPING CLASSIFICATION
PACKING

METHOCEL, a water soluble cellulose ether, from which is produced a superior film-forming material, was recently introduced by THE DOW CHEMICAL COMPANY of Midland, Michigan ✓ ✓ ✓ Methocel may be manufactured from cotton linters or from dissolving wood pulp ✓ ✓ ✓ Coatings manufactured from Methocel are colorless, odorless, tasteless, transparent and stable to heat and light ✓ ✓ ✓ Its properties appear to forecast unusual possibilities as an agent for dispersing, thickening, emulsifying sizing and coating.

METHOCEL applied to paper as a continuous surface coating produces a permanent barrier to penetration by oily or greasy materials ✓ ✓ ✓ For absolute greaseproofness, it is necessary that the coating be sufficiently heavy that no uncoated fibers project through it ✓ ✓ ✓ Methocel coatings also prevent undue penetration by lacquers, varnishes or waxes during their application to paper ✓ ✓ ✓ Surface application of Methocel to paper acts to bind fibers and eliminate "linting" or "picking" during printing ✓ ✓ ✓ In general, Methocel coatings contribute increased toughness and flexibility to paper in addition to providing a greaseproof, colorless, odorless coating.

A complete description of the properties of Methocel and a summary of its potential applications to paper and other products are given in a leaflet prepared by The Dow Chemical Company ✓ ✓ ✓ Copies may be obtained from the GREAT WESTERN DIVISION, THE DOW CHEMICAL COMPANY, 1201 Textile Tower, Seattle or 9 Main Street, San Francisco.

Electrical Developments of 1939

● At the end of each year Guy Bartlett of General Electric Company summarizes the year's developments in the electrical indsutry. A number of these improvements and new developments are of interest to the electrical men in the pulp and paper industry.

Mr. Bartlett, in his summary for last year, says in part:

"Nineteen hundred thirty-nine was a notable year in electrical progress. On an extremely broad front there were major advances, both in equipments and methods for the production and distribution of current and for the increased and improved application of electricity in industry, commerce and the home. Kilowatt-hour consumption again set a new record, with the increase particularly emphatic in the final quarter of the year. There were several weeks in which the output of the United States electric light and power industry exceeded 2½ billion kilowatt-hours.

"In hydroelectric developments activity was much greater than normal, and in the field of steam-turbine power generation there was emphatic progress in the use of high pressures and high temperatures for the turbines and of hydrogen-cooling for the generators. Particularly outstanding in the field of power transmission and distribution were the new oilless circuit breakers.

"In the use of electric power in industry there were such conspicuous advances as the new Amplidyne system of automatic control of speed and power, particularlv applicable in modern steel mills, and for motors the Valv-amp rotor giving a 'valve' effect for controlling starting current.

"A few more of the many advances of the year were the sealed-beam automobile headlight; further improvements in fluorescent lighting; introduction of television in a limited way; operation of frequency-modulation radio transmitters, with improved quality of programs and almost complete freedom from static and other interference; use of the radically new gas-insulated x-ray tubes of million volt rating; and the extensive application of a new enameled wire, Formex, which offers advantages marking it as the first major improvement in enameled wire coverings in 30 years.

"In this summary, which reviews these and many other developments of 1939, all items referred to are products of the General Electric Company and associated companies. These developments cover such a wide range that the references will serve as an indication of the tendencies in design and construction as well as the general progress in the electrical manufacturing industry as a whole.

Power—Generation, Transmission, Measurement

"Nearly one and one-half million kva of hydrogen-cooled turbine generators and more than a million horsepower of waterwheel-driven generators were under construction at Schenectady at the end of the year. Still other turbine generators, with air cooling, were being built, but hydrogen-cooling had attained dominance for larger turbine equipments. Thirteen Schenectady-built hydrogen-cooled generators, with a combined output of 680,000 kw, or 816,000 kva, were in operation; it was only a little more than two years previously that the first hydrogen-cooled turbine generator was placed in commercial service at Dayton.

"Developments in switchgear were particularly important. The most powerful oil circuit breakers, with an interrupting rating of 3½ million kva at 287,500 volts, were built. Two new oilless power circuit breakers were introduced, including an air-blast breaker in the larger sizes and a magnetic blow-out type for low-voltage systems. Unit substations were redesigned to incorporate removable breakers of metal-clad construction.

"In terms of kva-rating the largest self-cooled transformers with air-pressure cooling yet built at Pittsfield were produced for the new Oswego station of the Central New York Power Corporation. The over-all size and weight of large distribution transformers of distributed-core design were reduced, and a standardized design of network transformers, offering many advantages, was produced.

"In the field of ground-fault neutralizers a record for size was set by one of three installed for the new 260-mile 230-000-volt transmission line of Southern California Edison Company, Ltd. Such neutralizers, previously called Petersen coils, quench transitory ground faults on transmission lines simply, effectively, and at relatively low cost.

"A factory process that further improves the quality of the lead sheath of cable was introduced. The new process insures that the lead will be clean and free from dross and oxides and will have even more uniform thickness than previously.

"Carrier-current installations marked a long step forward in meeting the growing need for additional channels of greater flexibility and economy, yet capable of operation on closely adjacent channels on the same transmission line.

"An electric gage measuring steam pressures in locomotive engines speeding along at 100 miles an hour, a thickness gage to determine how much lacquer has been applied to a can or how much electroplating to sheet iron, vacuum-type radiation thermo-couples for temperature measurements, a portable varmeter for quickly determining power-factor of distribution lines, not to mention increased precision and added features of other meters and instruments — these were among the advances in measuring and recording devices.

Industrial—Equipment and Applications

"A new Val-amp rotor for electric motors of high starting torque and low starting current has a slot arrangement which inherently gives an electric "valve" effect for controlling starting currents. It is the first rotor with characteristics superior to those of the original Boucherot double-squirrelcage design patented about 40 years ago.

"The Amplidyne, essentially a motor-driven, compensated generator with an extra set of brushes for each set of poles, was developed to provide an efficient and economical way of handling and controlling large amounts of power. It gives exceedingly high amplification of d-c input and is particularly suited to many control applications.

"As electric equipment is called upon to perform more and more functions, and as the functions become more complex, there is a demand for new types of control equipment. Simultaneously there is a demand for improved models of existing devices. On both of these fronts there were important advances.

"Meeting a demand for heavy welding equipment, particularly of the multiple-operator type, a new design of 1500-ampere arcwelding set was produced. In the field of resistance welding there was produced a weld recorder—an instrument that, if faulty voltage or current threatens to spoil welds, will sound a warning, lock out the equipment, and record the variations of electric output.

"Reactrol control for automatically regulating electric furnaces was introduced; regulation of the energy input, and hence the temperature, is accomplished by automatically varying the voltage impressed on the heating unit. A two-chamber elevator furnace for annealing malleable iron castings, a new type continuous furnace for bright-annealing steel strip, and an unusual application of electric heat in the manufacture of insulated wire were among the year's high lights of industrial heating developments.

"The largest and fastest car dumper yet installed and use of variable-voltage drive for cableways handling concrete at a dam site were among the interesting developments in such equipments. A belt-conveyor system for moving gravel for the same dam also sets a record, since the pit is 10 miles from the site.

"In the machine-tool field there was produced a variable-voltage drive for reversing planers, with advantages of wide speed range (30-:1), extremely fast acceleration and deceleration, high cutting efficiency, accuracy in stopping, and simplicity of control.

"Bow correction for textile finishing, application of turbine-electric drive to printing and soaping ranges, and d-c braking of looms were among the contributions of electricity to the textile industry.

"Adjustment of transfer felt tension in paper making, two exceptionally large supercalenders, a sectional paper-machine drive of unusual size, and pulp-grinder motors establishing a record for size were among the developments in paper-mill equipment.

"There was produced a photoelectric system of color register control whereby registration of four colors can be maintained automatically within the tolerance permissible for intaglio or rotogravure printing at web speeds of approximately 1000 fpm.

"Amplidyne control was widely and successfully applied in various steel-mill equipments—as a current regulator for cold-strip tension reels, as a speed and current regulator for flying shears, for some special strip grinders, and for numerous other applications of similar nature. Several hot-strip mills, built 10 to 12 years ago, were modernized, increasing their maximum delivery speeds to 1600-1800 fpm — almost equalling most recently constructed mills. Rolling speeds of cold-strip mills were stepped up appreciably, particularly for rolling tin plate gages. A year before, a delivery speed of 1800-1900 fpm was considered the upper limit; speeds in excess of 2500 fpm are now projected, with driving motors of 3000 hp.—double the previous maximum capacity.

Illumination and Domestic, Commercial and Other Applications

"More than 970,000,000 incandescent lamps were sold in the United States during 1939, a preliminary survey indi-

cated. The figure, establishing a new volume record, includes 540,000,000 large and 430,000,000 miniature lamps. The sealed-beam headlight system for motor cars was an outstanding development; almost all 1940 cars are equipped with completely interchangeable sealed-beam headlamps of high precision. There were further improvements in fluorescent lighting and a healthy expansion in this field. The high-intensity mercury lamp, with a brilliancy of the order of one-third that of the sun, was further improved and applied more widely. . .

"In the field of air conditioning outstanding advances were reported particularly for oil burners and furnaces, warm-air conditioners, competely self-contained airconditioning units, and special air conditioners for use in connection with a remote source of refrigeration or heating. A complete new line of evaporative condensers was also developed. Several new fields of application for various products were uncovered. . . .

Research

"Most difficult to appraise are contributions of research to any one year's advances. Major advances from the laboratory may be reflected in a product commercially introduced during the same year, but it is much more likely that the research and fundamental engineering will be more apparent in the products of future years. In the research and other laboratories and in the engineering departments, investigations continued unabated—investigations in some cases reflected in a product commercially introduced during the year, but most commonly apparent in technical-society papers and presentations and, for the moment at least, more quickly recognized as pure or unapplied science.

"Glareless glass, improved Alnico magnet material, new alloys for varied applications, a new glass for sealing to iron, ozone generation with mercury tubes, a phototube responding greatly to ultraviolet light but hardly at all to visible light—these were a few of the products emanating from the Research Laboratory during the year.

Announce Improved Method Determining Pectin Content

● Research associates of the Textile Foundation stationed at the National Bureau of Standards of the Department of Commerce, have developed an improved method of determining the pectin content of cellulose fibers, and it is considered possible that this discovery may aid in further evaluating the properties of the fibers themselves.

The new method is based upon the rate at which carbon dioxide is evolved when uronic acids are treated with a boiling solution of hydrochloric acid.

Naturally-occurring cellulosic fibers, it is pointed out, appear to be a more or less intimate association of cellulose with other constituents, generlaly referred to as incrusting substances. A portion of these materials seems to be composed of uronic acids, presumably contained in the pectic substance of the fibers.

Many of the important properties of fibers, such as tensile strength, moisture and dye absorption, and viscosity in cuprammonium solution, have frequently been considered as related to the presence of small quantities of pectin. Since the Bureau wished to study this relationship in detail, it was necessary to develop a method for the estimation of pectin or its constituent uronic acids.

Methods were already available, based on the evolution of carbon dioxide when uronic acid is treated with a boiling solution of hydrochloric acid, but they all failed when cellulose or other carbohydrate materials were present, because these substances also decompose with the evolution of some carbon dioxide. However, when the rate of evolution was investigated it was found that pure uronic acids evolved the gas at a rapid rate, the evolution being complete in a matter of hours, while carbohydrates, free of uronic acids, evolved carbon dioxide at a much slower but approximatel" constant rate during the entire treatment. It was found that this difference in rates could be utilized for estimating uronic acids, even when mixed with large proportions of cellulosic materials.

Catto Transferred to San Francisco

● Andrew Catto of the office staff at the Camas mill of the Crown Zellerbach Corporation, has been transferred to the accounting department in San Francisco.

Gordon Godwin Joins Ontario Paper Company

● Gordon Godwin of Victoria, B. C., and a forestry graduate from the University of Washington, left the Coast January 2nd to become research logging engineer for the Ontario Paper Company of Thorold, Ontario. He will conduct research work in connection with tractor logging of the small timber grown in Ontario.

Following his graduation from the University of Washington Mr. Godwin spent two and a half years with the logging department of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation in Oregon, and then returned to his home in Victoria, B. C., to conduct research work for the provincial forestry department.

Canadian Log Exports Rise

● Exports of logs from Canada to the United States rose from 7,000,000 board feet in August, 1939, to 21,000,000 board feet in September and nearly 40,000,000 board feet in October, according to the Bureau of Foreign & Domestic Commerce, U. S. Department of Commerce.

Galloway Handling Bauer Bros. Sales

● Chas. A. Bauer, president and general manager of The Bauer Bros. Company, refiner manufacturers of Springfield, Ohio, recently announced the appointment of W. W. Galloway as sales manager of the Pulp and Paper Division. Mr. Galloway was formerly treasurer and general manager of the Hagar Straw Board and Paper Company of Cedarville, Ohio, and has been associated with Bauer Bros. since July, 1939. He is a member of TAPPI.

Mr. Bauer also announced that the sales of the Pulp and Paper Division had increased 40.1 per cent in 1939 over 1938, and new machines are being developed to further expand both sales and service.

Installation of Tug Boat Annie Under Way

The foundation for the new "Tug Boat Annie" which is to be installed at the California Fruit Wrapping Mills of Pomona, Calif., was poured early in December. The new unit is being shipped by the Shartle Brothers Machine Co., of Middletown, O., and is expected to arrive and be installed, ready for operation, early in the new year. It will be raised on nine-foot piers above the ground level. Both Nos. 1 and 2 machines will be supplied by the new unit. Its capacity will be 4,000 pounds. It incorporates the new Shartle stock cycling system including the new cyclifiiner. A new 5,000 square foot outdoor pulp stock flooring has been completed to provide space for storage now being taken up by the ground for the new equipment.

Murphy Named To Offices

● Robert G. Murphy, traffic manager of the St. Regis Kraft Company in Tacoma was recently elected vice-president of the Propeller Club of Tacoma. He was also recently appointed chairman of the transportation committee of the Tacoma Chamber of Commerce.

Link-Belt Coast Men Promoted

● Mr. B. A. Gayman, president of Link-Belt Company Pacific Division, San Francisco, announces the appointment of Harvey V. Eastling to the position of sales manager of the Pacific Division, with headquarters at the company's San Francisco office. He succeeds Ralph M. Hoffman, who, as announced recently, has been promoted to the position of Assistant to the President of the parent company, Link-Belt Company, with headquarters in Chicago.

Mr. Eastling started his Link-Belt career in 1925 at San Francisco. He soon rose to be head of the drafting room, and later became Pacific Division chief engineer. Besides serving in this capacity to the present time, he had also been assisting Mr. Hoffman in the sales department.

Mr. John ("Jack") F. Strott, until now chief draftsman at San Francisco, has been named to succeed Mr. Eastling as Pacific Division chief engineer. He has oeen closely associated with Mr. Eastling ever since 1925, the year in which Mr. Strott too started his Link-Belt career, and is said to have had a wide experience in the development and engineering application of Link-Belt products.

Pacific Division offices are located at San Francisco, Oakland, Los Angeles, Seattle and Portland.

H. V. Eastling

J. F. Strott

Trade Talk

of Those Who Sell Paper in the Western States

Paper Trade Conference Set for May 9-11th

● The 1940 Pacific Coast Paper Trade Conference will be held at Del Monte May 9, 10, and 11.

E. A. Breyman, Zellerbach Paper Co., San Francisco, will be chairman, and Edward L. O'Neill, secretary.

Bonestell, Sr., Retires From Active Business

● H. S. Bonestell, Sr., head of the pioneer San Francisco paper jobbing house, Bonestell & Co., retired from active business as of Jan. 1, 1940, according to an announcement by the company.

Mr. Bonestell had served the company for the past 35 years. He and Mrs. Bonestell recently returned to San Francisco from a three months' tour of the South Seas.

H. S. Bonestell, Jr., now heads the company as executive vice-president. He left for the East January 14, and will be gone about six weeks, visiting a number of paper mills en route.

He reports that the company's coarse paper business, which was started just a year ago, has grown by leaps and bounds, and that starting with two salesmen a year ago, they now employ seven in that department.

J. H. Bonestell, brother of H. S., Jr., is no longer connected with the company, but has entered other fields of endeavor.

Carter, Rice Have Own Line of Wrapping Papers

● Carter Rice & Co. have taken on a full range of distinctive wrapping papers, made under their own "Husky" products label. The papers are all produced in Pacific Coast paper mills.

Bay Region Paper Men Adopt Five-Day Week

● Eighteen members of the paper distributing trade in San Francisco, and seven in Oakland, sent out notices to their customers last month that after Jan. 2 they would go on a five-day week, remaining closed all day Saturday. The announcement said that the action was taken in keeping with the current trend toward the 40-hour week.

BM&T Celebrate Eighty-Fifth Anniversary

● The eighty-fifth anniversary of the founding of Blake, Moffitt & Towne is being celebrated during 1940. The company was founded in 1855, and is one of the oldest mercantile organizations on the Pacific Coast. Special advertisements will be run in trade papers commemorating the event.

Zellerbach Buys Walla Walla Paper Firm

● Effective January 1st the wholesale paper business of Tausick & Kauffman, Walla Walla, Washington, became a branch of the Zellerbach Paper Company, Division of Crown Zellerbach Corporation. The announcement was made by W. D. McWaters, manager of the Portland Division of the Zellerbach Paper Company.

Joe McAllister, for 29 years a salesman with the Walla Walla firm, has been placed in charge as district supervisor. The new branch will serve the territory from Pasco, Washington, to Baker and Enterprise in Oregon and to Pomeroy in Washington. The stock will be increased and printing papers added to the wrapping and stationery lines handled by Tausick & Kauffman.

Enquist Makes Last Call

● With the death of John A. Enquist, one of the first employes of the Zellerbach Paper Co., San Francisco, the paper industry loses another of the colorful old-timers who covered California in the days when freight trains and horse and buggy were frequently the only means of conveyance.

Mr. Enquist, who had been with the Zellerbach Company for the past 41 years, died at his home in Concord, Calif., Dec. 27. He was born in San Francisco in 1865.

"Al," as he was known, went to work for the Zellerbach Paper Company Feb. 1, 1899. His territory in those days was from Bakersfield to the Oregon Line, and he was a familiar and welcome sight to newspaper publishers and printers everywhere.

In more recent years "Al" made frequent trips to the Hawaiian Islands in the interests of his company, but lately his selling had been confined to the office, where he often played host to his customers of other years.

Funeral services were Masonic, and the pall bearers were L. A. Colton, C. E. Burgess, M. L. Colton, James R Davis, E. J. Tracy, all of the Zellerbach Paper Company, and Gus Johnson, Everett Pulp & Paper Co. Leon Lowenthal, Zellerbach Paper Co., conducted the Masonic funeral rites.

This is an artist's drawing of the new building at 5th and Everett Streets which will henceforth house the Portland Division of the Zellerbach Paper Company. Every modern aid to assure customer satisfaction has been incorporated in this structure, which marks an important forward step in the Company's operations in the State. The official opening will be held Saturday, January 20, when the entire building will be open to visitors.

Lewis Transferred To Sacramento

● Richard A. Lewis, for the past 13 years representative for the Zellerbach Paper Company at Chico, California, was transferred on January 1st to Sacramento. Taking his place at Chico is Fred Pepper who had previously been at Sacramento.

According to the announcement by Lee Doherty, division manager, Mr. Lewis will be one of three senior salesmen who will act in the capacity of assistant sales managers and have several junior salesmen under them.

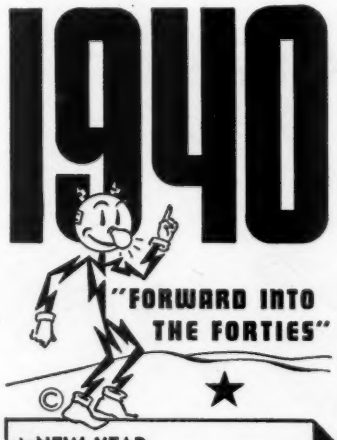
Mr. Lewis was active in civic and fraternal affairs at Chico.

Dougan Transferred to Lamont Headquarters

● Roy Dougan, formerly Pacific Coast manager of Geo. Lamont & Son, has left to do sales work at the plant, Nutley, N. J. His place on the Coast has been taken by Victor Savale, who was formerly Pacific Coast representative for the concern, making his headquarters in San Francisco.

Neumann and Beswick Attend Hammermill Meeting

● Bert Neumann and Dan Beswick, San Francisco Division, Zellerbach Paper Co., have just returned from Erie, Pa., where they participated in the Hammermill Sales Course. Neumann was elected president of the Eighteenth Sales Study Group of the Paper Co.



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Pritchard With Paper Supply In Los Angeles

● Charles Pritchard, formerly sales manager with Bonestell & Co., pioneer San Francisco paper jobbing house, is now connected with the Paper Supply Co., Los Angeles.

Northern California BM&T Men Hold Conference

● Blake, Moffitt & Towne held its annual Northern California sales meeting December 27, 28 and 29 in San Francisco. The first two days just members of the San Francisco sales force attended. The last day all Northern California divisions were represented.

On the last night of the conference all attended dinner at the Hotel Empire, and later adjourned to attend a mass meeting in the auditorium of the San Francisco Stock Exchange on the industrial situation in San Francisco, along with several hundreds of representatives from other San Francisco wholesale houses.

Death Takes Mrs. Taft

● Mrs. Myrtle Taft, for the past seven years in the headquarters accounting department, Zellerbach Paper Co., San Francisco, died Dec. 27.

BM&T Employees Hold Dinner Dance

● Employees of the San Francisco Division, Blake, Moffitt & Towne, gave a dinner dance at the Acquatic Park Casino, San Francisco, that was a huge success, Dec. 15. Music was furnished by members of their own organization.

Lloyd Drury Dies in San Francisco

● The many friends of Lloyd Drury, salesman with the San Francisco Division, Zellerbach Paper Company, for the past 27 years were grieved to hear of his death last month. He leaves his wife and two married daughters to mourn his passing.

Hold Christmas Party

● The Crown Zellerbach Club, composed of members of the headquarters groups of the corporation, held a most enjoyable Christmas party at the St. Francis Hotel, Dec. 22.

Skrivanic Leaves Western Paper Converting Company

● Frank E. Skrivanic resigned from the Western Paper Converting Co. in November. Mr. Skrivinac had been affiliated with this firm since 1927 when he was sales representative covering the northwest territory. In 1934 he went to Los Angeles to be sales representative in that area covering southern California, Arizona and New Mexico, in which post he was when he resigned.

When the company installed a converting operation, the manufacture of glassine bags in the Los Angeles headquarters, Mr. Skrivanic was also in charge of this. Although his plans for the immediate future have not been announced, he will probably be located on the Pacific coast in the paper industry. His many years in the industry have made for him friends in all parts of the country in the paper trade.

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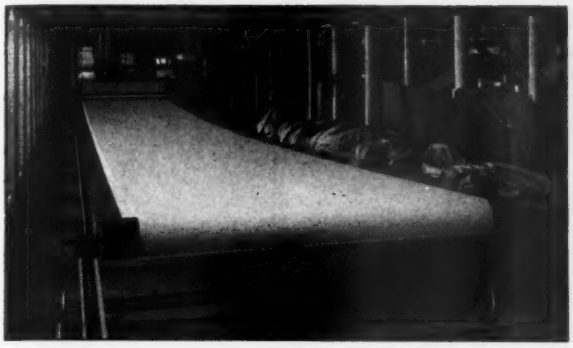

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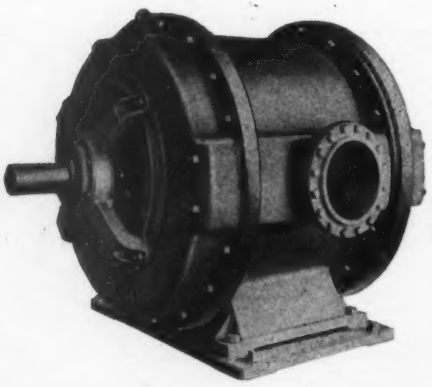

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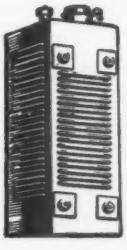

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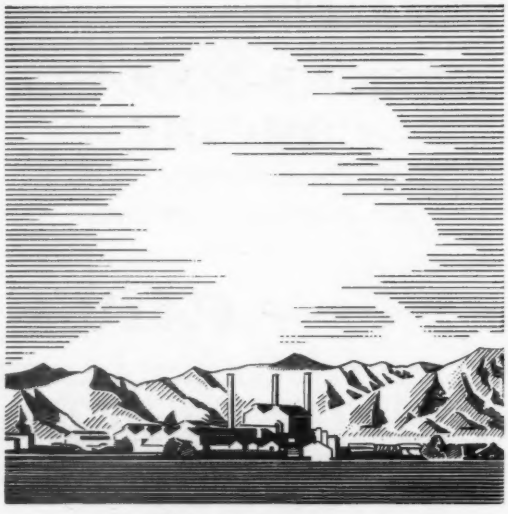

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